

# Railway Age Gazette

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IN Professor Emory R. Johnson's report on tolls for the Panama canal, published elsewhere in this issue, emphasis is laid on the advisability of making the canal self-supporting. Professor Johnson examines the question, of course, in a judicial spirit, weighing the arguments, if arguments they may be called, against such a course with a care that would only be justified by the fact that the government has passed the Panama canal bill exempting American coastwise vessels from the payment of canal tolls. The point that Professor Johnson makes with care and precision is that if the canal is to be self-supporting, and the charges are to be reasonable enough to make the route via Panama effectively competitive with the Suez canal route, American vessels must be charged the same tolls as foreign vessels; and if this policy is adopted, the conservative estimates that are made in the report would tend to show that there is a prospect

of putting this great investment by the government on a sound business basis. The record of the post office department, in its often almost blind opposition to anything that carries a suggestion of sound business methods or principles, ought to be so clear a warning against departure from these principles for the purpose of favoring certain classes that no further argument should be necessary.

SEVERAL times during recent years we have suggested the advisability of having a closer co-operation between the various associations in the railway mechanical department. For instance, the Master Mechanics' Association might well call upon some of the highly specialized associations, which have to do with the details of mechanical department work, to investigate certain subjects and make recommendations to the larger association. There is still a broader application for this principle. One subject which the Master Mechanics' Association might find it very profitable to investigate and report upon would be recommended practice for investigating the detail methods which should be followed in properly selecting a locomotive for the most economical operation. Such a report, to be complete, might require the co-operation of the American Railway Engineering Association. For instance, the development of the larger and more powerful locomotives, or of certain special designs, might make it advisable to expend a greater amount of money for new locomotives and their maintenance, rather than to make expensive changes in the grade or other features which are maintained under the direction of the engineering department, or vice versa. If a problem of this kind was referred to a joint committee of these two associations it would be possible to outline those features in both the mechanical and the engineering departments which must be considered in selecting new locomotives, and methods could be suggested as to how railway officers could best go about the matter in order to properly weigh the various features involved and decide upon the most satisfactory type of locomotive for efficient and economical operation. Since, in its last analysis, it is an operating problem, it might be well for the American Railway Association to take the initiative and call upon these associations for such a report.

THE train dispatcher's problems are always with us. As certain magazines have maintained a chess players' column for a half-century, more or less, so the *Railway Age Gazette* might perennially entertain its readers with discussions concerning the best way of settling those numerous questions in single-track train movement which always appeal to different minds in different ways. We print a letter on this subject in another column of this issue. As most of our readers know, our own view is that the only place to cut off this dog's tail is immediately behind his ears. Our solution of the question is presented in a single line at the bottom of the letter. But the dispatcher replies that we have not met his case. This is obvious, for we have not the pen with which to put his general manager's signature to our decision; and therefore we print the letter. We have great admiration for the train dispatchers on the railways in America, and we constantly marvel at their feats of reasoning and at their successful playing of chess with their eyes blindfolded; but to the man, even the active railroad man, who is not constantly breathing the dispatchers' atmosphere, some of their bridges seem pretty shaky; like those of the Kansas Pacific A. D. 1871. According to the standard code a westbound extra waiting at a station for a westbound passenger may proceed after the passenger has passed. But if there is no telegraph office and if the second section of the passenger is only ten minutes behind five, on some roads we may have a slow freight ahead of a fast passenger train. If the extra starts out under protection of its flagman it must wait (a half-mile out) for him to regain his caboose; and he must have taken good care to leave torpedoes, according to the rule. Isn't this a masterpiece of scientific management? Mr. Brandeis, if he could comprehend it, would

delight in such clumsy arrangements. However, this is no more absurd than the general idea of a slow train running ahead of a fast one "until overtaken." What a confusing bunch of uncertainties of time intervals and flagging modifications are bound up in those two words! And what a multitude of futile discussions have been held during the past twenty-five years concerning the propriety (or otherwise) of having the mention of a schedule always include all sections of that schedule. We believe in strict adherence to rules; but we also believe in safe practice; and so we are forced, in this case, to agree with both sides! This drives us back to the point where we started; use an absolute space interval. If conductors and enginemen by "reasoning" can permit themselves to take the same risks in running east against westbound No. 15 that they take in running west ahead of second No. 3, it is high time to adopt some system that does not so freely encourage "reasoning." When we speak of taking risks, we can hear hisses in the audience, but "reasoning" in the caboose frequently brings in so many elements of uncertainty that taking chances is quite likely to come next. Competent conductors and enginemen do not take chances where the chance involves a possibility of danger; but candor compels the admission that now and then a conductor or engineman not rated at 100 per cent. participates in a discussion where unauthorized "reasoning" has free scope. There is where the danger comes in. One way to describe the block system would be to call it the system which discourages fruitless discussions. It does away with trainmen's nightmares.

#### CROSSOVERS IN HIGH SPEED PASSENGER TRACKS.

A GREAT deal of attention is being given to the subject of long turnouts and crossovers as a result of the recent New Haven wreck at Westport, Conn., following the accident of July, 1911, at Bridgeport, Conn., on the same road, both of which were due to engineers attempting to pass through No. 10 crossovers at excessive speeds. This raises the question of what the safe speed through crossovers is, the best manner in which it may be regulated, and the extent to which short crossovers are justified in high speed passenger tracks.

The number of crossovers and the number of movements through them have increased greatly in recent years with the addition of multiple main tracks, until on many roads trains are diverted freely from one track to another as traffic conditions require. When this diverting was confined to low speed movements short turnouts were fairly satisfactory, but in recent years there has arisen a demand for longer turnouts to lessen the delays to fast passenger trains due to reduction in speed until now No. 15 and No. 20 turnouts are very generally installed where such movements are numerous. As, with the present state of development of switch construction it is not practical to decrease the thickness of the switch point much below one-half inch, it does not seem advisable or necessary to decrease the frog angle below that of a No. 15 or No. 20, since the switch angle is now the critical point in the turnout and trains passing the switch point will go through such a turnout without difficulty. In an article in the *Railway Age Gazette* of December 15, 1911, page 1234, F. S. Stevens pointed out that it is not now practical to decrease the switch angle much below one deg. and drew the conclusion that no flatter frog than a No. 15 is justifiable because of this condition. Although many engineers agree with Mr. Stevens' conclusion, others are using No. 20 turnouts, believing that his conclusion is somewhat too conservative since the sharp curvature extends but a few feet back of the switch point and the flatter turnouts are at least on the side of easy riding track. There is little difference of opinion, however, regarding the advisability of using at least a No. 15 turnout. While the New Haven has been severely criticised because of these accidents, and the belief exists in many quarters that No. 10 crossovers are standard on that road, the existing instructions have been to replace all shorter crossovers with No. 15 which are standard and which are being installed wherever possible.

As an operating problem, some prominent railway men believe that the longer turnouts alone do not tend towards safety and that the remedy for such accidents as those on the New Haven lies in proper discipline and enforcement of the speed restrictions rather than in the installation of longer turnouts. Too much stress cannot be laid upon the importance of discipline, but, important as discipline is, the fact remains that trains will pass safely through long turnouts at speeds which would derail them on shorter ones. The same argument for discipline might be, and has been used against the installation of derails, yet they are today regarded as being of almost universal necessity.

Long turnouts were originally installed in high speed tracks as an operating measure to reduce the delays resulting from reduction in speed when diverting trains from one track to another. Their use permits higher speeds, and at the same time, increases the safety of travel in the few instances where engineers do not properly reduce speed at such points. However, even with the long turnouts commonly used in the interest of safety, speed restrictions are still necessary and must be enforced. The safe maximum speed depends on local conditions, and while under some favorable conditions it may be as high as 70 miles per hour, in most places it is generally considered advisable to reduce it to half this figure. In some cases, as at the convergence of double track, it may be possible to divide the curvature between the two tracks by placing a frog in the center and thereby decreasing the switch angle and the resultant shock to the train so that high speeds may be safely maintained. However, in most cases it is impossible to favor the turnout in this way, and it must lead out from straight track, requiring the speed to be reduced through the crossover. In such cases the maximum limits of speed for No. 20 turnouts are set at 35 miles per hour on most roads, and seldom exceed 40 miles. Once these speed limits have been fixed, it is essential that they be observed and enforced. In this regard the disciplinary remedy is more important than the lengthening of the crossover, for it is entirely possible to pass through a long crossover at a speed which will cause an accident similar to those on the New Haven.

While long turnouts are to be generally recommended for high speed traffic, local conditions frequently make their installation impracticable, a fact which must be borne in mind by those demanding the universal use of flat turnouts. In many cases the existing track and interlocking layouts, etc., will not permit their use. The length of a No. 20 crossover between tracks spaced 13 ft. center to center, is about 386 ft., and that for a No. 15 is about 320 ft. Even allowing for a double crossing or scissor arrangement between the two center tracks this requires nearly 1,200 ft. with No. 20 turnouts or nearly 1,000 ft. with No. 15 turnouts between outlying switches on a four-track line. This emphasizes the necessity for conservative action and a consideration of all phases of the subject for, while long crossovers are to be generally recommended, this recommendation must be considered in all cases in the light of local conditions which may render a long crossover impractical in any particular instance. As an example of the action which public commissions may take in response to public outcry, the Connecticut Public Utilities Commission has ordered that where high speed trains are to be diverted from one track to another and the crossover through which they must pass is not safe for high speeds, these trains must be brought to a full stop before switches are set for crossover movement. The commission evidently takes the position that if a crossover is not safe for high speeds it is not safe for any speeds, making no provision for limited speed without a full stop. On the same theory trains should be required to come to a full stop before passing over any piece of track on which there is a slow order. The commission evidently does not take into consideration the fact that while a piece of track may not be safe for trains running 60 miles an hour, it may be perfectly safe for trains running half that fast. It will be interesting to observe the effect of this order upon the schedules of fast trains. It is certain that the schedules will have to be



lengthened to make up for these additional stops, or that speed between stops will have to be increased, which is itself objectionable from the standpoint of safety. The remedy for these cross-over accidents does not rest solely, as some railway men would have us believe, in proper disciplinary measures or as some regulating authorities seem to think, in long crossovers alone, but in the combination of the two, balanced as local conditions will permit.

#### THE DECISION IN THE UNION PACIFIC MERGER CASE.

THE Supreme Court of the United States is the final authority in this country regarding the meaning of the laws. Good citizens accept its interpretations and applications of them without cavil or complaint. It is in this spirit that its decision holding illegal the merger of the Union Pacific System and the Southern Pacific Company should be received. The court says that, under the Sherman anti-trust law, the combination of these railways is in unreasonable restraint of trade, and therefore unlawful. That settles the meaning of the law as it applies to the Harriman System; but when the Supreme Court settles that the law is this or that, it does not follow that this settles what the law ought to be. A perfectly valid law in the constitutional sense may be a very bad law in an economic sense. The consequence of its economic defects will be to do harm. And this is what will be the result in this instance.

The court holds that prior to the acquisition of the Southern Pacific by the Union Pacific there was substantial competition between these roads. Their consolidation eliminated this competition, and in this the illegality of the combination consists. The competition interfered with was in the making of rates and in the rendering of service. Was the competition in rate-making a good thing? Economic opinion says it was not. When railways compete in the making of rates they always compete harder for the business of big shippers than of little shippers, and the result is unfair discrimination in favor of the big shippers. Competition in price-making of any kind, to be effective, must ordinarily be accompanied by secrecy as to the prices made; and so the competition in rate-making which the consolidation of these roads tended to reduce often took the form of the making of secret rates. Public opinion, concurring with economic opinion, decided that unfair discrimination and secret rates and rebates, which were the direct results and the principal instruments of competition in rate-making, were an evil. Therefore, Congress passed and the Interstate Commerce Commission is enforcing legislation which prohibits secret rates and unfair discrimination. The day that this legislation became effective, competition in railway rates was abolished. It never can be revived, except by repealing the legislation that destroyed it. Nobody favors the repeal of that legislation. It follows that this decision cannot have the slightest tendency to restore the competition in rate-making which it is held the combination of the Union Pacific and the Southern Pacific unlawfully tended to destroy. There are numerous transcontinental lines including the Canadian Pacific, the Chicago, Milwaukee & St. Paul, the Gould lines, the Great Northern, the Northern Pacific, the Union Pacific System, the Southern Pacific System and the Santa Fe. There is no competition now in rate-making between the Southern Pacific and the Union Pacific on the one hand and the other transcontinental lines on the other. On what rational grounds can anyone think, then, that competition is going to be restored by taking two of these roads, which are now under the same control, and putting them under separate control?

The second kind of competition with which the combination is held to have interfered is competition in service. Unlike competition in rate-making, competition in service still exists throughout the country. The very destruction of competition in rate-making has tended to increase competition in service, because when two or more roads make the same rates between the same points, the only means left to them for attracting

business from each other is rivalry in service. There probably is keener competition in service between the transcontinental lines today than there ever was before. Their service probably is better than it ever was before. Is this decision going to increase that competition? It is hard to see how it can. Even if it does, it is questionable if the results will be beneficial. For the more competition in service there is, the more it costs to render the service; and the more it costs the railway to render the service, the more in the long run the shipper and traveler are going to have to pay for it.

While the decision probably will have little or no tendency to accomplish the result sought by the Sherman Act—namely, to restore and stimulate competition—it will, it would seem, make it necessary to operate the Union Pacific System and the Southern Pacific System by different managements. The result must be to destroy the organization for operating the entire system which was built up by Mr. Harriman and has been modified and developed by Judge Lovett, Mr. Kruttschnitt and their associates. This operating organization has achieved remarkable results. It has developed the physical properties to a high state of excellence, has greatly improved the service rendered by the associated lines, and has at the same time worked them economically. No one questions the high efficiency of the operating organization of the Harriman system. The efficiency that has been attained has been largely due to the fact that it has been possible to standardize equipment and methods for a very large mileage of line, and to a large extent to pool the facilities of this large mileage, thereby making them available at any given time wherever they are most needed, while keeping the total investment in them lower than it could have been kept without this pooling of facilities. Destruction of this splendid operating organization must have a tendency to render it impossible to operate these roads with as rapidly increased economy and efficiency as has been the case in the past. Therefore, the tendency of the decision is to increase the cost that the railways must incur in rendering their transportation, and to increase, or interfere with the reduction of, the rates that the public must pay. On the whole, therefore, it is impossible to imagine a single dollar's worth of benefit that will accrue from the decision to the public, and it is easy to see how it may tend to injure the public.

One of the interesting points in the decision is that in which the court indicates that the Union Pacific may retain the line of the Central Pacific from Ogden to San Francisco. This shows that the court's conception of competition is that it is restricted to railways paralleling each other and reaching the same points. Evidently even the Supreme Court nods once in a while in considering points of railway economics.

The question naturally arises, if the Union Pacific and Southern Pacific combination is illegal and must be broken up, what must be done about several other combinations between railways, which it would seem must be held to be even more active competitors than the Harriman lines? It would seem that either all combinations of parallel railways between which there is or might be substantial competition must be broken up, or that the Sherman Act as it applies to railways must be amended. If all these combinations between parallel lines are to be dissolved, the railway lines will still exist and will still be operated after the dissolutions have been effected. The Constitution will not permit reasonably well managed railways to be deprived of a fair return. If, therefore, the effect of dissolution of the various combinations is to so increase operating expenses as to impair the capacity of the roads to get reasonable net earnings nothing can prevent them from so readjusting their rates as to get fair returns. Therefore, there is nothing in the decision to unduly alarm railway security holders. The harm, if harm there is, ultimately will be suffered mainly by the public.

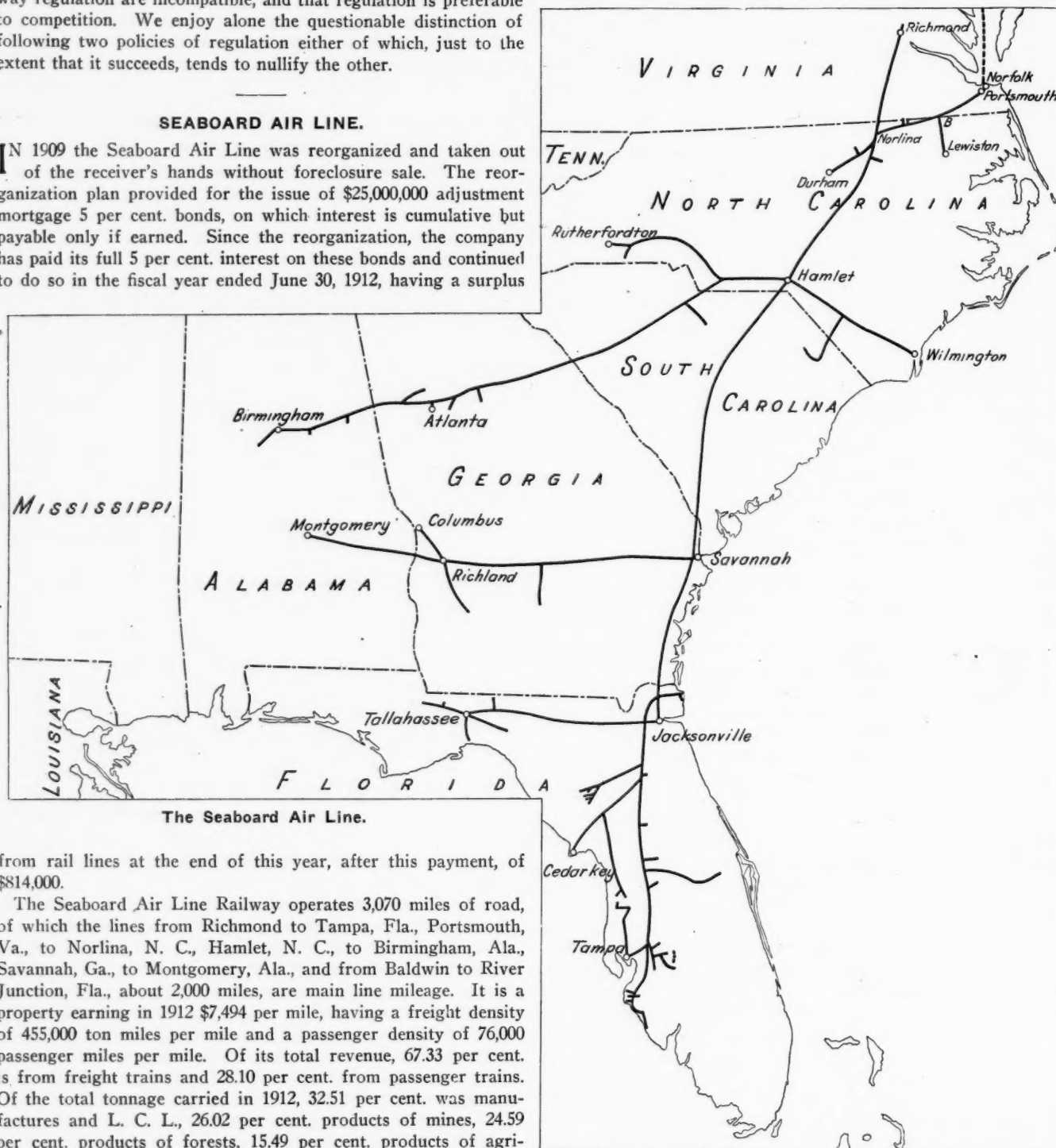
Meantime, our dual plan of, first, adopting legislation for the regulation of railways which makes competition in rate-making impossible and creating state and interstate commissions to

enforce these laws, and, second, passing and enforcing other laws to compel the competition which the former class of legislation has abolished, will continue to make us the laughing stock of other nations. In every other civilized country the principle has been recognized by statesmen and economists and acted upon in legislation that enforced railway competition and railway regulation are incompatible, and that regulation is preferable to competition. We enjoy alone the questionable distinction of following two policies of regulation either of which, just to the extent that it succeeds, tends to nullify the other.

#### SEABOARD AIR LINE.

IN 1909 the Seaboard Air Line was reorganized and taken out of the receiver's hands without foreclosure sale. The reorganization plan provided for the issue of \$25,000,000 adjustment mortgage 5 per cent. bonds, on which interest is cumulative but payable only if earned. Since the reorganization, the company has paid its full 5 per cent. interest on these bonds and continued to do so in the fiscal year ended June 30, 1912, having a surplus

total operating revenue, and 34.08 per cent. in 1911. Maintenance of way and structures consumed 14.60 per cent. in 1912 and 13.02 per cent. in 1911; and maintenance of equipment, 14.01 per cent. in 1912 and 13.25 per cent. in 1911. The vice-president and general manager's report ascribes the increase in operating expenses to increased charges to maintenance on account of



The Seaboard Air Line.

from rail lines at the end of this year, after this payment, of \$814,000.

The Seaboard Air Line Railway operates 3,070 miles of road, of which the lines from Richmond to Tampa, Fla., Portsmouth, Va., to Norlina, N. C., Hamlet, N. C., to Birmingham, Ala., Savannah, Ga., to Montgomery, Ala., and from Baldwin to River Junction, Fla., about 2,000 miles, are main line mileage. It is a property earning in 1912 \$7,494 per mile, having a freight density of 455,000 ton miles per mile and a passenger density of 76,000 passenger miles per mile. Of its total revenue, 67.33 per cent. is from freight trains and 28.10 per cent. from passenger trains. Of the total tonnage carried in 1912, 32.51 per cent. was manufactures and L. C. L., 26.02 per cent. products of mines, 24.59 per cent. products of forests, 15.49 per cent. products of agriculture, and 1.19 per cent. products of animals.

Total operating revenues amounted to \$23,744,000 in 1912, comparing with \$22,606,000 in 1911. Despite larger earnings from both passengers and freight in 1912 than in 1911, the increase in operating expenses more than offset the increase in earnings, so that after the payment of expenses, taxes, interest and rentals, including interest on the adjustment bonds, there was a net corporate income of \$814,000 in 1912, as against \$1,708,000 in 1911. The ratio of operating expenses to total operating revenues in 1912 was 71.02, as compared with 66.48 in 1911. Transportation expenses in 1912 consumed 36.36 per cent. of

increased amount of work done over the previous year; to increased cost of materials, and to increased wages paid to employees in the roadway, mechanical and transportation departments. Weather conditions were unfavorable for a number of months of the year, which also added to the cost of operation. Furthermore, there was a reduction in the average receipts per ton mile, so that while the freight revenue was greater by 4.26 per cent. in 1912 than in 1911, totaling this last year \$15,433,000, ton mileage carried increased by 9.04 per cent., totaling 1,391,000,000 in 1912.



The most noticeable change in the character of traffic is a much smaller percentage of products of lumber tonnage carried in 1912 than in 1911, with an increase in the percentage of tonnage of products of mines and of manufactures. Furthermore, the increase in tonnage of manufactures is due to a larger tonnage of low-grade traffic, such as iron, brick, etc. Under ordinary circumstances, and with the majority of roads, an increase in the proportion of low-grade tonnage would be marked by a reduction in operating expenses due to the economies of handling such traffic.

The greater part of the tonnage carried by the Seaboard originates on its own lines. Furthermore, it will be seen from the map that the Seaboard does not get a long through haul on a good part of its traffic. Traffic, for instance, originating on the Montgomery line and destined for New York moves, presumably, to the nearest seaport and from there goes by water. Slow freight for points via Jacksonville moves by rail and water, high-class freight moves all rail. The average haul is not long, being 148 miles in 1912 and 142 miles in 1911. This compares with an average haul on the Atlantic Coast Line of 154 miles in 1912. The average receipts per ton per mile, notwithstanding the decrease from 1911 to 1912, are quite good, being 1.11 cents in 1912 and 1.16 cents in 1911. This compares with 9.87 mills average receipts per ton per mile on the Southern.

The Seaboard took advantage of this increase in proportion of low grade traffic to increase its total train load, including company material, from 251 tons to 268 tons; but even taking into account this increase of 17 tons in train load, the figures are not as high as it would seem that the road is capable of developing. The Atlantic Coast had a train load in 1912 of 208 tons. The Seaboard has a considerable tonnage of phosphate, amounting in 1912 to 972,000 tons, or 10.34 per cent. of the total tonnage.

The car loading was slightly better in 1912 than in 1911, averaging 16.84 tons per loaded car mile last year, as against 16.21 tons per car mile in 1911. This compares, however, with car-loading per loaded car mile on the Southern of 17.97 per loaded car mile in 1912.

Total operating expenses in 1912 amounted to \$16,280,000, as against \$14,481,000 in 1911. All classes of expenses increased, transportation expenses amounting to \$8,333,000 in 1912, an increase over 1911 of \$910,000. Not only did wages increase, but it cost more for fuel and for train supplies. There was also a rather large increase in the cost of injuries to persons, which totaled \$422,000 in 1912, as against \$268,000 in 1911. With an increase in ton mileage of over 9 per cent., there was an increase in revenue freight train mileage of but 2.8 per cent. and an increase of less than 1 per cent. in freight locomotive mileage. The cost per locomotive mile run, however, for wages of engine-men, firemen and engine house expenses was 8.79 cents in 1912, as against 7.85 cents in 1911; and for fuel, 15.07 cents, as against 13.88 cents. The cost of fuel on the Seaboard is very high. The company at present has comparatively little coal on its own lines and gets part of its coal from the Carolina, Clinchfield & Ohio, at Bostic, N. C. The fuel cost per locomotive mile is over 15 cents on the Seaboard.

The physical property of the Seaboard is in good condition. Its standards have been high for the South and have been well maintained. On the main line between Richmond and Tampa and Hamlet and Birmingham 85-lb. rail has been the standard, and all new rail laid on main line will be 90-lb., except between Montgomery and Savannah and between Baldwin and River Junction, where 80-lb. rail will be used. There were at the end of 1912 77 miles of road laid with 85-lb. rail and 117 with 80-lb. rail and 1,242 miles with 75-lb. rail.

In 1912 the company spent \$1,094 per road mile for maintenance of way and structures, comparing with \$934 per road mile spent in 1911. Between one-fifth and one-sixth of all ties were renewed in 1912, which would indicate that the present policy is to make ample tie renewals. The Seaboard has a good

timber supply and gets pine ties laid down alongside track at about 38 cents. These ties should have a life of from six to seven years, except possibly in parts of Florida, where they will rot more quickly. It will be seen, therefore, that if between one-fifth and one-sixth of all ties were renewed last year, the company is not deferring maintenance.

Maintenance of equipment cost \$3,212,000, which is 11 per cent. more than in 1911. The cost of repairs per locomotive was \$2,638 in 1912, and \$2,543 in 1911. The cost per passenger car was \$813 in 1912, and \$764 in 1911; and the cost per freight car was \$64 in 1912, and \$59 in 1911.

In addition to the cost of upkeep of the property, the company spent \$1,666,000 for additions and betterments to existing mileage; \$1,760,000 for equipment, in addition to renewals; and \$266,000 for extensions.

The Seaboard Air Line is a rather heavily capitalized property when compared with the Atlantic Coast Line. The total funded debt, including the equipment certificates and the adjustment bonds (interest on which, however, is not a fixed charge), averages \$33,800 per mile on the Seaboard, as against the funded debt, including equipment certificates outstanding on the Atlantic Coast Line, of something slightly over \$30,000 per mile. Stock outstanding on the Seaboard amounts to \$19,900 per mile, and on the Atlantic Coast Line, before the recent increase, to \$13,200 per mile.

The only financing of any importance that was done by the Seaboard was the delivery of \$4,000,000 4 per cent. refunding bonds sold in the previous fiscal year. From the proceeds of this sale the company paid off \$954,000 loans and bills payable, leaving no loans and bills payable at the end of 1912. The company also, of course, used the money received from this sale for expenditures for additions and betterments. Cash at the end of 1912 totaled \$1,693,000, as against \$2,243,000 at the end of 1911, and total working assets amounted to \$4,323,000 at the end of 1912. Working liabilities amounted to \$2,945,000 at the end of 1912, and to \$3,790,000 at the end of 1911. While \$1,693,000 is not a large amount of cash on hand for such a road as the Seaboard, its mortgage provides that the company may issue \$2,750,000 for improvements and extensions; and with the increased earnings shown by the monthly statements since the close of the fiscal year, the company ought to be able, during the present fiscal year, to considerably strengthen its cash position.

Since the close of the fiscal year there has been a change in the personnel both of the management and of the board of directors, indicating a desire to give the property more local autonomy. S. Davies Warfield, of Baltimore, chairman of the executive committee, has been made also chairman of the board of directors. Other local directors have been put on the board. W. J. Harahan, vice-president of the Erie and formerly general manager of the Illinois Central, has been elected president, succeeding N. S. Meldrum, of New York; and C. H. Hix, vice-president and general manager, has resigned to become president of the Norfolk Southern. His place has not as yet been filled.

The Seaboard Air Line is carrying a heavy unextinguished discount on securities sold. While there is at the end of 1912 a profit and loss surplus of \$4,949,000, there is, on the other hand, \$10,588,000 unextinguished discount on securities shown under deferred debit items. The Interstate Commerce Commission's rules provide that there must be charged from income during each fiscal period such proportion of unextinguished discount and expenses on funded debt in accordance with a general plan which will extinguish the entire discount and expenses between the date of sale and the date of maturity, and the bonds on account of which this unextinguished discount is carried still have from 40 to 50 years to run. It will be seen by the table at the end of these remarks that the Seaboard has charged to income this year \$248,000. The commission, however, also permits the charging of further amounts to profit and loss so

as to extinguish discount in a shorter period. Of this privilege the Seaboard has not found it advisable to avail itself.

The following table gives the principal figures for operation in 1912, as compared with 1911:

	1912.	1911.
Mileage operated .....	3,070	3,046
Freight revenue .....	\$15,433,239	\$14,801,969
Passenger revenue .....	5,050,068	4,735,504
Maint. of way and structures .....	3,347,359	2,836,577
Maint. of equipment .....	3,212,278	2,884,953
Traffic .....	715,361	711,839
Transportation .....	8,333,358	7,423,677
Total operating expenses .....	16,280,087	14,480,567
Taxes .....	917,000	818,000
Net operating income .....	5,724,817	6,483,437
Gross corporate income .....	5,875,358	6,629,390
Net corporate income .....	813,786	1,707,965
Discount on bonds .....	248,193	178,637
Surplus .....	565,593	1,529,328

#### NEW BOOKS.

*Some Facts About Treating Railroad Ties.* By W. F. Goltra, president of the W. F. Goltra Tie Company, Cleveland, Ohio. 105 pages, 6 in. x 9 in. Price, \$1.

Mr. Goltra was formerly general tie agent of the New York Central lines west of Buffalo, and is well known among timber treating engineers throughout the country. The book is devoted to the advocacy of full cell treatment and preliminary steaming, being largely a reprint of articles printed in the technical press by Mr. Goltra and others.

*Railroad Operating Costs.* By Suffern & Son, New York. Volume 2. Cloth, 144 pages, 11 in. x 8 in. Price, \$2.

Although the publishers call this Volume 2, it is actually a second revised, enlarged and very much improved edition of what they call Volume 1. As originally published, the study in operating costs was suggestive but somewhat crude in treatment, and the criticism to a certain extent was destructive rather than constructive. In preparing the present volume the authors have profited by their experience with the first volume and by the considerable criticism, both constructive and destructive, which had been made by railway men concerning the book. The consequence is that the present volume is a very much more finished work and one which will be of interest and use to a great number of railway men. The book is very profusely illustrated with diagrams; in fact, nearly every point that is made is illustrated by a diagram. Operating costs are treated under the divisions prescribed by the Interstate Commerce Commission, with the exception that traffic expenses and general expenses are not given chapters by themselves. A further chapter has been added on fuel, and the discussion on the cost of maintenance of equipment has been given four chapters. The book discusses at some length the different units that are usually used in making comparisons of costs as between different roads. The fallacy of comparisons by the use of such units is shown and the diagrams show comparisons for the same costs on different unit bases. There are no new units suggested that have not been tried probably by some accounting officers or railway statisticians, but by having them all combined and shown graphically, each student of railway operations is able to draw his own conclusions as to the value and lack of value of the different units. The figures are brought up to include 1911. In a way there are no conclusions reached in the book; but in a broader sense this is a conclusion in itself. In other words, each case, each separate railway, each particular year's operation of that railway presents certain problems which are unique in themselves, and one of the points of value about Railroad Operating Costs is that it serves as a reminder of what pitfalls to look out for and by so doing suggests, by way of elimination, what may be learned from any given set of figures. It is a book suitable more especially for use by railway officers who can make their own studies of costs and can draw their own conclusions from them. To such an officer the book serves as a test to which he should put his own figures, and from the results of this test be enabled to properly get at the real causes as distinguished from apparent causes.

## Letters to the Editor.

### REWARDING MERIT.

CINCINNATI, Ohio, November 25, 1912.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

"Wanted, Efficient Employers—Must Be Honest and Loyal" is the startling title of an able and pertinent contribution to a business periodical of recent issue. But why should it startle us? Surely we have long since had a surfeit of articles mournfully dwelling upon the inefficiency of the average employee. Efficiency and loyalty should not be monopolized by employees, but developed and bestowed upon them as freely as demanded by employers.

From long and intimate association and experience in both the traffic department of railroads and in connection with one of the largest and most important shippers' organizations in the country, the writer has been forced to conclude that the average railroad employee is not nearly as inefficient as we have been led to believe; and, moreover, efficiency is not speedily or adequately rewarded by heads of departments in the carrier service.

Civil service in railroading is not yet so generally recognized as it should be. Thousands of good appointments are still made from outside the service, which not only causes demoralization, but a general feeling of dejection, leading toward discouragement and apathy, so fatal to good work. Whereas, if the civil service principle were more generally adopted and applied, it would undoubtedly appreciably tone up the general morale and quicken the *esprit de corps*, which is vital for developing efficiency.

For example: The general manager of one of the large trunk lines operating out of Cincinnati was complaining of the increased demands and exactions of organized labor, when a friend undertook to show him that the short-sighted policy of the average operating official was really largely responsible for the very existence of labor organizations, by admonishing him substantially as follows:

Friend: "Is the young man who just brought in that correspondence a good, loyal, industrious and efficient worker?"

Gen. Man.: "Yes; first-class."

Friend: "How long has he been in his present position?"

Gen. Man.: "About eleven or twelve years."

Friend: "Always been prompt, loyal and thoroughly reliable?"

Gen. Man.: "Yes, so far as I know."

Friend: "What salary does he command?"

Gen. Man.: "Why, \$65 per month, I believe."

Friend: "Now, don't you see that you are largely responsible for labor unions? Had this man been identified with some labor organization he would have commanded from \$90 to \$125 per month, and likely be required to work shorter hours. If you have an efficient man in your employ, of proven loyalty and worth, why don't you do your plain duty and either raise the man's salary or promote him to a more lucrative position? That is the one and only way to check and circumvent labor organizations."

So many of our employers seem to be obsessed with the idea that loyalty should be one-sided, instead of a virtue mutually possessed and exercised. Set your employee an example in loyalty by being loyal and solicitous of his welfare, and it is ten to one you will be paid in kind. It is but good, sound business policy after all, this one of mutual service. Some of our more astute and sagacious captains of industry are seeing the light, and have learned that the only way to keep labor organizations in check is by not delegating so much of their own duties to labor leaders.

Co-operation is the coming spirit and watch-word. Profit-sharing is even being advocated by some of the largest and more advanced business institutions, such as The Procter & Gamble Company, N. O. Nelson Supply Company, and The



Larkin Company. Andrew Carnegie is advocating profit-sharing as the most effective means for successfully combatting the unreasonable exactions of labor. And all this is but sound common sense and enlightened self-interest. P. R. HOWARD.

#### LABOR AND THE RAILWAYS.

NEW YORK, October 17, 1912.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In his letter to you of September 11, President W. G. Lee, of the Brotherhood of Railroad Trainmen, discussing the relations of railways and employees, says: "There are some among our members who are irrational and demand unreasonable things, but they are few as compared with the great mass who only want a square deal and a fair share of the earnings that they help to produce."

It would appear from the figures assembled by H. T. Newcomb in his article on "Railway Capitalization and Traffic," in your issue of September 13, "that the railways are so organized that for each employee they transported last year 150,061 tons of freight and 19,089 passengers one mile."

To what extent, then, does the employee help to produce the earnings of the railways? Disregarding altogether the passengers carried, a strong man could carry, let us say, 200 lbs. twenty miles in a day, or in a year he could transport 700 or 800 ton miles. The average employee apparently does about one-half of 1 per cent. of the work. The balance is done by capital and managerial skill.

Evidently Mr. Lee will have to find some other basis for his claim; our old friend, "supply and demand," a "living wage," "the productivity of the marginal unit," etc., etc.

I would not bother you with my views were it not that I believe that the cause of much of the bitterness in wage discussions is the belief that labor does not receive a "fair share of the earnings that it helps to produce," based upon the fallacious idea that "labor produces it all," whereas the fact would appear to be that in the modern industrial organization labor, however, essential it may be, as a contributing factor produces but a small fraction of the output.

F.

#### PUBLICITY METHODS ON THE MISSOURI PACIFIC.

ST. LOUIS, Mo., November 16, 1912.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I noticed in a recent issue of your paper (*Railway Age Gazette*, November 1, page 826) a communication from Wilbur E. Warr, editor of the *Ludington (Mich.) Daily News*. Mr. Warr seeks to show that the railroads antagonize the press, and cites the difficulties he had in obtaining information concerning a railroad wreck. Very justly he criticizes this method of dealing with newspaper men; but he is mistaken in assuming that all railroads nowadays pursue that policy.

On the Missouri Pacific-Iron Mountain system the instructions are that whenever a wreck occurs the publicity department shall be notified at once and be made acquainted with all essential details as soon as they can be learned. This department immediately notifies the newspapers and the Associated Press without waiting for them to ask for the particulars. Every fact of interest to the press or people is given them.

It is a rare thing that a wreck occurs anywhere on this system without the newspapers getting their first information about it from the publicity department of the road. In St. Louis the Associated Press and all the papers are called up by telephone and given the facts as promptly as they reach the railroad headquarters. As a result, newspapers on hearing any rumor or report of an accident on this road immediately call up the publicity department for the facts. If no information has reached this department, an investigation is immediately made, and if there is any foundation for the report the details are gathered and given to the papers at once. An evidence of how the work

of the publicity department of this road is appreciated is the following letter received last July by the writer from H. T. Ashbaugh, the correspondent in charge of the Associated Press forces at St. Louis:

I wish to express my sincere appreciation of the work of your department. It has been of great assistance to the local office of the Associated Press and we have come to look upon it as "first aid" in everything pertaining to the Missouri Pacific and Iron Mountain.

In two ways especially you have aided us in getting the real facts to the readers of the 850 papers in the membership of the Associated Press. First, by furnishing the facts for publication no matter if the news concerned referred favorably or otherwise to the companies you represent, and, second, by aiding us in keeping from our wires what are commonly called "rumors" of wrecks, in which the loss of life is usually untrue or vastly overstated.

In conversation with the manager of the Missouri Pacific publicity bureau Mr. Ashbaugh stated that the Associated Press used the facts as given by the railroad in preference to reports received from correspondents or other sources, as they had found them much more reliable—in fact, absolutely accurate. "In putting on the wire an account of a wreck furnished by a railroad," said Mr. Ashbaugh, "we usually send it out as a statement furnished by the road. In the case of wrecks on the Missouri Pacific-Iron Mountain System, however, we print the matter furnished by the publicity department, not as a statement of the railroad, but as the facts, because experience has taught us that we can rely on every statement made and that nothing is being concealed or withheld."

The first disastrous wreck which occurred on the Missouri Pacific-Iron Mountain after B. F. Bush became president of this system was at Fort Crook, Neb., just outside of Omaha, in which seven persons were killed and twenty-three injured. This was on Sunday, October 15, 1911. Mr. Bush immediately wired for all details and had the publicity department prepare a 1,500-word account of the disaster giving a full list of the killed and injured, together with their addresses. This account also contained every essential fact regarding the collision and cited the cause. Copies were given to all of the St. Louis papers, and the Associated Press here, and were wired to the Omaha and Kansas City dailies and every other daily newspaper printed on the division of the railroad on which the disaster occurred. These telegrams were all sent over the Western Union wires at the expense of the railroad, and it was the first detailed account of the accident received by the newspapers. The list of dead and injured given by the Associated Press and newspapers was made up almost entirely from the names furnished by the railroad.

Instructions were wired to employees to get the names and addresses of the killed and injured as soon as possible, and to immediately notify the relatives and friends in each case. The division officials were also instructed to see that the newspapers were aided in every way by the officials and employees in getting all facts and details of the disaster.

The *Omaha World-Herald* in its account of the catastrophe the next day gave as much prominence to the action of President Bush in making known all details of the wreck as it did to the collision itself. That newspaper in its account said among other things:

It is the first time a railroad corporation has ever gone to the extent of utilizing its great organization for the gathering and publication of facts in an accident of this character and marks a new era in the attitude of railroad corporations toward the public; the attitude taken in its recently reiterated promises to take the public into its confidence rather than to attempt to cover up facts and render the gathering of news difficult. The report sent out differs only in minor details from that gathered by the *World-Herald* staff. While it does not paint the horrors of the wreck in vivid detail, it does not attempt to cover up or gloss them.

Local officials of the Missouri Pacific Railroad were most considerate in furnishing information to the *World-Herald* with reference to the disaster.

Geo. W. Wickersham, Attorney General of the United States, speaking of the road's action said: "That was a fine thing President Bush did, it is a departure in railroading. It is a departure in newspaper work also. Such action serves to give the public confidence in a railroad, and in the man who takes such a decided step forward. But the time is coming

soon when every railroad must do things of that kind. The public is entitled to the truth in such matters. Whenever newspapers can place confidence in the reports of railroad officials they will cease searching for the frills and will be contented with a straightforward statement of facts. President Bush seems to have recognized this in so quickly sending a complete statement to the newspapers. He is the forerunner, and others must follow."

While the Missouri Pacific has never had so serious a wreck since, the policy pursued in that case is followed in handling news of all disasters on the lines of the system, so that Mr. Warr's complaint against the railroads does not, I am glad to say, apply to all of them. While I do not know that there is any other railroad that goes to the extent of notifying the newspapers of all accidents immediately, I have it on the very best authority that there are other systems that let the press have the facts when called upon for them. I agree with Mr. Warr that the old system of endeavoring to conceal them was bad policy, but I believe that it is being gradually abandoned in the railroad world, and that it is only a question of time until all transportation companies will be forced to adopt the plan of giving the public the facts concerning catastrophes in which there is a loss of life or injury to persons.

J. W. KEARNEY,  
Manager Publicity Dept., Missouri Pacific-Iron Mountain System.

#### TOO MUCH CHANGING OF TRAIN RULES.

NASHVILLE, Tenn., November 22, 1912.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Some time since the Train Rule Committee of the American Railway Association made a ruling to the effect that should a work extra be given working orders until say 6:30 p. m., and also receive an order to meet some regular train, that the meeting order did not become void at 6:30 p. m. when the work extra lost life, but that the work extra must be waited for by the regular train indefinitely, unless the meeting order were annulled.

It is establishing a dangerous precedent to tamper in this manner with a well established theory, which in other cases must be construed just the opposite way. For instance, the rules provide that when a train becomes 12 hours late, is annulled, or loses life through a time-table change in which it is omitted from the new table, all orders held by or relating to it become void. It is also well understood that when an extra's running orders expire, all of its other orders become void, even though they may be addressed to "All Concerned," and must be again issued when such engine is again given orders to run extra, even though to continue in the same direction. Therefore, it would have been much better to have said that an order to meet a work extra in such cases was not the proper way to handle the matter, but a "wait" should have been employed, requiring the regular train to wait until 6:30 p. m. Had the committee handled the matter in this way there would have been no inconsistencies in its rulings.

A late ruling of this committee is causing me grave apprehension.

The question was asked: "Question.—Extra 1540 west received the following order: 'Extra 1540 west run ahead of No. 3, engine 2189—until overtaken.' Extra 1540 west is overtaken by No. 3, displaying signals; has Extra 1540 west the right to proceed ahead of second No. 3?"

Answer.—Under the order quoted, Extra 1540 west will run ahead of No. 3 until overtaken, and then arrange for No. 3 to pass promptly.

Below this answer, rules 95 and 218 are quoted, and then the committee goes on and says: "It is, therefore, necessary for Extra 1540, after being overtaken by first No. 3, unless otherwise directed, to remain on the siding until all sections of No. 3 have passed."

I at first thought that this ruling was based upon the fact that the engine number might be used to identify a section, although rule 206 instructs otherwise, but I have learned

that in reaching a decision in the matter the engine was not a factor. It seems that there has existed a misunderstanding on a few roads as to the proper way to handle such cases and that the decision may have been made to harmonize with the practice on these few roads, instead of deciding the matter strictly upon its merits and the theory of rule 218.

The words, "unless otherwise directed," can mean but one thing: must be otherwise directed by train order, that is, receive further orders to run ahead of the other sections. In other words, the ruling means that the order is fulfilled, or void, as may best suit the student, when the extra is passed by the first section of No. 3. The term "unless otherwise provided," has such meaning when applied to some other code rules.

Fully 90 per cent. of the railroad men throughout the United States understand rule 218 to mean that, unless particular sections are specified, an order to run ahead of No. 3 gives right to run ahead of all sections of that schedule; being passed by one or more sections does not tie up the inferior train. An order to meet No. 3, holds the superior train with which No. 3 is met, for all sections of No. 3. An order giving an extra right over No. 3, from A to C, gives the extra right over all sections of that schedule to C. Should the extra find sections of No. 3 at either A or B, it would continue to C against the remaining sections, for the simple reason that all are included, when particular sections are not specified.

Trainmen and enginemen who may read this ruling in their employees' journals are likely to reason as follows (and a collision may result): "If the order to run ahead is of no further effect when passed by the first section, an order to meet No. 15, an inferior train, is in the same manner of no further effect after the first section has arrived, and we will not wait for the others. If the order becomes void for me in the case of running ahead, it likewise becomes void for me when given right over a superior train and the first section is encountered at some intermediate station, and we are tied up." The above are only a few of the well founded principles that have been disturbed by this most remarkable decision.

A theory cannot be split up. If the order becomes of no further use to the extra when passed by the first section of No. 3, the same misunderstanding will prevail in all cases where a schedule is spoken of, instead of sections; and this means that inferior trains are going to be run into through the dangerous precedent that has been handed down in this decision.

Feeling convinced beyond any possibility of a doubt that the decision is not for the best, and in direct conflict with the meaning of rule 218, I shall have to decline to adopt, or teach it.

H. W. FORMAN.

Moral: Use the block system.—EDITOR.

LOCOMOTIVE SHORTAGE IN INDIA.—The Karachi Chamber of Commerce has received a letter from the manager of the Jodhpur-Bikanir Railway, stating that it is impossible for his railway to take over more than 100 cars daily at Kuchaman Road for want of locomotives; that they have engines on order; and that until the new engines arrive they can do nothing better.

CONSTRUCTION IN CHINA.—Definite plans for resuming the preliminary survey by American engineers of the West River Railroad, by which Yunnan will be connected with Canton via the Province of Kwangsi, are about to be carried into effect, if in fact the surveying party is not already in the field. The surveyors are instructed to go as far as Nanning via Pese, some 600 miles. This is an indication that something will be done toward the realization of a line so much needed in this southwestern part of China. The latest report in regard to the railroad connecting the tin mines at Kochiu with the main French line (from Haifong to Yunnanfu) at Mengtze is that it is to be built by a French firm.



# UNION PACIFIC-SOUTHERN PACIFIC MERGER DISSOLVED.

The Full Text of Justice Day's Opinion in the Unanimous Supreme Court Decision in the Harriman Lines Merger Case.

The Supreme Court of the United States on Monday last, in the long pending suit of the government to annul the control of the Southern Pacific by the Union Pacific as repugnant to the Anti-trust law of 1890, handed down a decision, prepared by Justice Day sustaining the government and condemning the action of the roads.

The case was begun in the United States Circuit Court for the District of Utah to enforce the provisions of the so-called Sherman Anti-Trust act of 1890.

The case in its principal aspect grew out of the purchase by the Union Pacific Railroad Company in the month of February, 1901, of certain shares of the capital stock of the Southern Pacific Company from the devisees under the will of the late Collis P. Huntington, who had formerly owned the stock. Other shares of Southern Pacific stock were acquired at the same time, the holding of the Union Pacific amounting to 750,000 shares, or about 37½ per cent. (subsequently increased to 46 per cent.) of the outstanding stock of the Southern Pacific Company. The stock is held for the Union Pacific company by one of its proprietary companies, the Oregon Short Line Railroad Company.

A large amount of testimony was taken and the case heard before four Circuit Judges of the Eighth District, resulting in a decree dismissing the bill. (188 Fed. Rep. 102.)

Prior to the stock purchase in 1901 the Union Pacific system may briefly be described as a line of railroad from the Missouri river to the Pacific coast, namely, from Omaha, Neb., or, perhaps more strictly, from Council Bluffs, Iowa, and from Kansas City, Mo., to Ogden, Utah, and Portland, Ore., with various branches and connections, and a line of steamships from Portland to San Francisco, Cal., and from Portland to the Orient; and a line of steamships from San Francisco to the Orient (the Occidental and Oriental Steamship Company), in which the Union Pacific and the Southern Pacific each owned a half interest.

The main line from Council Bluffs to Ogden, a little over 1,000 miles in length, with the branch from Kansas City through Denver, Col., to Cheyenne, Wyo., on the main line, was owned and operated by the Union Pacific; the line from Granger, Wyo., on the main line of the Union Pacific, to Huntington, Ore., was owned and operated by the Oregon Short Line Company, the capital stock of which was owned by the Union Pacific; and the railroad from Huntington to Portland was owned and operated by the Oregon Railroad and Navigation Company, the stock ownership of which was in the Oregon Short Line. The boat line from Portland to San Francisco and to the Orient, the Portland and Asiatic Steamship Company, was organized early in 1901, its stock being owned by the Oregon Railroad and Navigation Company.

The Southern Pacific Company, a holding company of the state of Kentucky, also engaged in operating certain lines of railroad under lease, controlled a line of railroad extending from New Orleans through Louisiana, Texas, New Mexico, Arizona, California and Oregon to Portland, reaching Los Angeles and San Francisco, with several branch lines and connections extending into tributary territory.

A line of boats running between New York and New Orleans was also owned and operated by the Southern Pacific, and later the same ships entered the Port of Galveston, where also the Southern Pacific reached tidewater, and it had branches extending to various points in Northern Texas connecting with other lines of road.

The Southern Pacific also operated, under lease, the railroad of the Central Pacific Railway Company, all the stock of which is owned by the Southern Pacific. The lines of the Central Pacific consisted of the road from San Francisco to Ogden, about 800 miles in length and connecting at the latter place with the Union Pacific and the Denver & Rio Grande. It also had

various branches in and about California, aggregating about 500 miles.

The Southern Pacific also owned a majority of the Southern Pacific Mail Company, which operated a line of steamships plying to ports in the Orient and running between San Francisco and Panama, with which the Panama Railroad and its boats constituted the so-called Panama route.

The contention of the government is that, prior to the stock purchase, the Union Pacific and Southern Pacific were competing systems of railroad engaged in interstate commerce, and acted independently as to a large amount of such carrying trade, and that since the acquisition of the stock in question the dominating power of the Union Pacific has eliminated competition between these two systems, and that such domination makes the combination one in restraint of trade within the meaning of the first section of the act of Congress of July 2, 1890, and the transaction an attempt to monopolize interstate trade within the provisions of the second section of the act.

In view of the recent consideration of the history and meaning of the act (Standard Oil and Tobacco cases, 221 U. S., 1 and 106, respectively) it would be superfluous to enter upon any general consideration of its origin and scope. In certain aspects the law has been thoroughly considered and its construction authoritatively settled, and in determining the present controversy we need but briefly restate some of the conclusions reached. The act applies to interstate railroads as carriers conducting interstate commerce, and one of the principal instrumentalities thereof. (United States vs. Trans-Missouri Freight Association, 166 U. S., 290; United States vs. Joint Traffic Association, 171 U. S., 505.) The act is intended to reach combinations and conspiracies which restrain freedom of action in interstate trade and commerce and unduly suppress or restrict the play of competition in the conduct thereof. (United States vs. Joint Traffic Association, *supra*.) In that case an agreement between competing interstate railroads for the purpose of fixing and maintaining rates was condemned.

"It is," said the court (P. 571), "the combination of these large and powerful corporations, covering vast sections of territory and influencing trade throughout the whole extent thereof, and acting as one body in all the matters over which the combination extends, that constitutes the alleged evil, and in regard to which, so far as the combination operates upon and restrains interstate commerce, Congress has power to legislate and to prohibit."

In the Northern Securities Company vs. United States (193 U. S., 197), this court dealt with a combination differing in character from that considered in the Trans-Missouri and Joint Traffic cases, and it was there held that the transfer to a holding company of the stock of two competing interstate railroads, thereby effectually destroying the power which had theretofore existed to compete in interstate commerce, was a restraint upon such commerce, and Mr. Justice Harlan, announcing the affirmance of the decree of the Circuit Court, said (P. 337):

"In all the prior cases in this court the anti-trust act has been construed as forbidding any combination which by its necessary operation destroys or restricts free competition among those engaged in interstate commerce; in other words, that to destroy or restrict free competition in interstate commerce was to restrain such commerce. Now, can this court say that such a rule is prohibited by the Constitution or is not one that Congress could appropriately prescribe when exerting its power under the commerce clause of the Constitution? Whether the free operation of the normal laws of competition is a wise and wholesome rule for trade and commerce is an economic question which this court need not consider or determine."

Mr. Justice Brewer, who delivered a concurring opinion, while expressing the view that the former cases were rightly decided,

said that they went too far in giving the reasons for the judgments, and declared his view that Congress only intended to reach and destroy those contracts which were in direct restraint of trade, unreasonable and against public policy. He was nevertheless emphatic in condemning the combination effected by the Northern Securities Company and the transfer of stocks to it, which policy, he declared, might be extended until a single corporation with stocks owned by three or four parties would be in practical control of both roads; or, viewing the possibilities of combination, the control of the whole transportation system of the country; and in concluding his concurring opinion said (P. 363):

"It must also be remembered that under present conditions a single railroad is, if not a legal, largely a practical monopoly, and the arrangement by which the control of these two competing roads was merged in a single corporation broadens and extends such monopoly. I cannot look upon it as other than an unreasonable combination in restraint of interstate commerce—one in conflict with state law and within the letter and spirit of the statute and the power of Congress."

Of the Sherman act and kindred statutes this court, speaking by Mr. Justice McKenna, said in *National Cotton Oil Company vs. Texas* (197 U. S., 115, 129):

"According to them, competition, not combination, should be the law of trade. If there is evil in this, it is accepted as less than that which may result from the unification of interest and the power such unification gives, and that legislatures may so ordain this court has decided (*United States vs. E. C. Knight Company*, 156 U. S., 1; *United States vs. Trans-Missouri Freight Association*, 166 U. S., 290; *United States vs. Joint Traffic Association*, 171 U. S., 505; *Northern Securities Company vs. United States*, 193 U. S., 197; *Swift & Co. vs. United States*, 196 U. S., 375)."

In the recent discussion of the history and meaning of the act in the *Standard Oil* and *Tobacco* cases this court declared that the statute should be given a reasonable construction, with a view to reaching those undue restraints of interstate trade which are intended to be prohibited and punished; and in those cases it is clearly stated that the decisions in the former cases had been made upon an application of that rule, and there was no suggestion that they had not been correctly decided. In the *Tobacco* case, after referring to the previous decision in the *Standard Oil* case and the decision in the *Trans-Missouri* and *Joint Traffic* cases, the doctrine was tersely summarized by the Chief Justice, speaking for the court, as follows (P. 179):

"Applying the rule of reason to the construction of the statute, it was held in the *Standard Oil* case that, as the words 'restraint of trade' at common law and in the law of this country at the time of the adoption of the anti-trust act only embraced acts, or contracts, or agreements, or combinations, which operated to the prejudice of the public interests by unduly restricting competition, or unduly obstructing the due course of trade, or which, either because of their inherent nature or effect, or because of the evident purpose of the acts, etc., injuriously restrained trade that the words as used in the statute were designed to have and did have but a like significance."

It was, therefore, pointed out that the statute did not forbid or restrain the power to make normal and usual contracts to further trade by resorting to all normal methods, whether by agreement or otherwise, to accomplish such purposes. In other words, it was held, not that acts, which the statute prohibited, could be removed from the control of its prohibitions by a finding that they were reasonable, but that the duty to interpret, which inevitably arose from the general character of the term "restraint of trade," required that the words "restraint of trade" should be given a meaning which would not destroy the individual right to contract, and render difficult, if not impossible, any movement of trade in the channels of interstate commerce, the free movement of which it was the purpose of the statute to protect.

We take it, therefore, that it may be regarded as settled, applying the statute as construed in the decisions of this court, that

a combination which places railroads engaged in interstate commerce in such relation as to create a single dominating control in one corporation, whereby natural and existing competition in interstate commerce is unduly restricted or suppressed, is within the condemnation of the act. While the law may not be able to enforce competition, it can reach combinations which render competition impracticable. (*Swift & Co. vs. United States*, 196 U. S. 375.)

Nor do we think it can make any difference that, instead of resorting to a holding company, as was done in the *Northern Securities Company* case, the controlling interest in the stock of one corporation is transferred to the other. The domination and control, and the power to suppress competition, are acquired in the one case no less than in the other, and the resulting mischief, at which the statute was aimed, is equally effective whichever form is adopted. The statute in its terms embraces every contract or combination, in form of trust or otherwise, or conspiracy in restraint of trade or commerce. This court has repeatedly held that this general phraseology embraces all forms of combination, old and new.

"In view of the many new forms of contracts and combinations," said the Chief Justice in the *Standard Oil* case (P. 50), "which were being evolved from existing economic conditions, it was deemed essential by an all-embracing enumeration to make sure that no form of contract or combination, by which an undue restraint of interstate or foreign commerce was brought about, could save such restraint from condemnation."

A more effectual form of combination to secure the control of a competing railroad than for one road to acquire a dominating stock interest in the other could hardly be conceived. If it is true, as contended by the government, that a stock interest sufficient for the purpose was obtained in the *Southern Pacific Company*, with a view to securing the control of that company and thus destroying or restricting competition with the *Union Pacific* in interstate trade, the transaction was, in our opinion, within the terms of the statute.

That the purchase was legal in the state where made, and within corporate powers conferred by state authority, constitutes no defense, if it contravenes the provisions of the Anti-Trust act, enacted by Congress in the exercise of supreme authority over interstate commerce. (*Northern Securities Company vs. United States*, supra, 334; *Standard Oil Company vs. United States*, supra, 68; *United States vs. American Tobacco Company*, supra, 183.)

It is said, however, and this was the view of the majority of the Circuit Judges, that these railroads were not competing, but were engaged in a partnership in interstate carriage as connecting railroads; and it was further said that the *Southern Pacific*, because of its control of the line from Ogden to San Francisco and other California points, was the dominating partner.

A large amount of the testimony in this voluminous record was given by railroad men of wide experience, business men, and shippers, who, with practical unanimity, expressed the view that prior to the stock purchase in question, the *Union Pacific* and *Southern Pacific* systems were in competition, sharp, well defined, and vigorous, for interstate trade. To compete is to strive for something which another is actively seeking and wishes to gain. The *Southern Pacific* through its agents, advertisements, and literature had undertaken to obtain business for its "Sunset," or southerly route across the continent, while the *Union Pacific* had endeavored in the same territory to have freight shipped by way of its own and connecting lines, thus securing for itself about 1,000 miles of the haul to the coast.

To preserve from undue restraint the free action of competition in interstate commerce was the purpose which controlled Congress in enacting this statute, and the courts should construe the law with a view to effecting the object of its enactment.

Competition between two such systems consists not only in making rates, which, so far as the shipper was concerned, the proof shows, were by agreement, fixed at the same figure whichever route was used and then apportioned among the con-



necting carriers upon a basis, satisfactory to themselves, but includes the character of the service rendered, the accommodation of the shipper in handling and caring for freight, and the prompt recognition and adjustment of the shipper's claims.

Advantages in these respects were the subjects of representation and the basis of solicitation by many active, opposing agencies. The maintenance of these by the rival companies promoted their business and increased their revenues. The inducement to maintain these points of advantage—low rates, superiority of service, and accommodations—did not remain the same in the hands of a single dominating and common ownership, as it was when they were the subjects of active promotion by competing owners whose success depended upon their accomplishment.

The consolidation of two great competing systems of railroad engaged in interstate commerce by a transfer to one of a dominating stock interest in the other creates a combination, which restrains interstate commerce within the meaning of the statute, because, in destroying or greatly abridging the free operation of competition theretofore existing, it tends to higher rates. (*United States vs. Joint Traffic Association*, supra, 577.)

It directly tends to less activity in furnishing the public with prompt and efficient service in carrying and handling freight and in carrying passengers, and in attention to and prompt adjustment of the demands of patrons for losses, and in these respects puts interstate commerce under restraint.

Nor does it make any difference that rates for the time being may not be raised and that much money is spent in improvements after the combination is effected. It is the scope of such combinations and their power to suppress or stifle competition or create monopoly, which determines the applicability of the act. (*Pearshall vs. Great Northern Railway Company*, 161 U. S. 646, 676; *United States vs. Joint Traffic Association*, supra.)

It is urged that this competitive traffic was infinitesimal when compared with the gross amount of the business transacted by both roads, and so small as only to amount to that incidental restraint of trade which ought not to be held to be within the law. But we think the testimony amply shows that while these roads did a great deal of business for which they did not compete, and the competitive business was a comparatively small part of the sum total of all traffic, state and interstate, carried over them, nevertheless such competing traffic was large in volume, amounting to many millions of dollars.

Before the transfer of the stock this traffic was the subject of active competition between these systems, but by reason of the power arising from such transfer it has since been placed under a common control. It was by no means a negligible part, but a large and valuable part of interstate commerce which was thus directly affected.

The fact that the Southern Pacific had a road of its own from the Gulf to the Pacific coast did not prevent competition for this traffic. The Union Pacific and its connections were engaged in the same carrying trade, and, as a matter of fact, were competing for that trade by all the usual means of competition resorted to by rival railroad systems. As this court said, speaking by Mr. Justice Holmes in *Swift & Co. vs. United States*, supra, 398:

"Commerce among the states is not a technical legal conception, but a practical one, drawn from the course of business."

That commerce, as conducted from the east to the Pacific coast, was, in a substantial part, the subject matter of rivalry and competition between these two systems. Since the stock transfer the companies have chosen common officers and the rival soliciting agencies have been for the most part abandoned.

It is contended that the Union Pacific was but a connecting road and really had no line to San Francisco, but was dependent upon the Southern Pacific for such terms as it could make over the old Central Pacific line, from Ogden to San Francisco.

The facts disclose, as we have already said, that the Union Pacific had a line to Portland by way of the Oregon Short Line and the Oregon Railroad and Navigation Company, and thence to San Francisco by steamboat connection. It may be admitted

that this was a much longer route than by way of the Ogden connection, and that, as a practical matter, nearly all of the freight intended for San Francisco and nearby points went over the Ogden route. Nevertheless, the Portland route was a factor in rate-making to the coast, and the testimony shows that the Union Pacific and the Southern Pacific, up to the time of the sale of the stock, had been working for many years under a satisfactory arrangement as to rates.

It is going too far to say that the Union Pacific was entirely at the mercy of the Southern Pacific in making rates for freight by way of the Ogden connection because the latter company controlled the old Central Pacific line to San Francisco.

It certainly would have been very detrimental to the Southern Pacific to have declined an arrangement for the carriage of freight received from the Union Pacific and its connections for transportation to California by way of the Ogden route. The traffic manager of the Southern Pacific testified that the division of the through rate from Omaha to San Francisco has been the same since 1870; that he thought it unfair to the Southern Pacific, but that it was the best that could be obtained at the time.

One of the reasons for the Central Pacific leasing its lines to the Southern Pacific, as set forth in the lease, was that the Union Pacific had secured control of the Oregon Short Line, and thereby obtained an outlet to the Pacific other than over the Central Pacific, "and thus in that respect placed itself in opposition to the interests of the Central Pacific," and that it was "not only to the best interests of, but absolutely necessary that, the Central Pacific Railroad Company, in order to maintain itself against these diversions (of the Union Pacific and others), should be operated in connection with a friendly through line to the waters of the Atlantic."

Nor do we think it can be justly said that because of the connections with the Rio Grande Road at Ogden the Southern Pacific was in position to discriminate at will against the Union Pacific in such wise as to greatly impair the latter road's carrying trade upon eastbound freights. In this connection it is said that since the consolidation, notwithstanding the former published rates are maintained, the favoring attitude of the Southern Pacific to the Union Pacific practically destroyed the carrying trade from Ogden to the east for the Rio Grande system and necessitated the construction by the latter road of a new connection for California points, and that such would have been the fate of the Union Pacific upon disagreement as to rates with the Southern Pacific.

In reference to this point, we think it is pertinent to consider the acts of Congress known as the Pacific Railroad acts. These acts required the two roads, the Central Pacific and Union Pacific, to be "operated and used for all purposes of communication, travel, and transportation, so far as the public and government are concerned, as one connected, continuous line" (12 Stat. 489, 495, Act of July 1, 1862, Sec. 12), and in such operation and use "to afford and secure to each equal advantages and facilities as to rates, time, and transportation, without any discrimination of any kind in favor of the road or business of any or either of said companies, or adverse to the road or business of any or either of the others." (13 Stat. 356, 362, Act of July 2, 1864, Sec. 15.) They also authorized the consolidation of the roads.

These acts, it is said, are only intended to secure the permanent physical connection of the roads and to provide for equal accommodations upon the basis of independent carriage, and outline no method by which the two roads can be compelled to make a joint through rate; and that at the time of the stock transfer there was no such provision in the interstate commerce acts. Therefore it is said that the Union Pacific, no less than the Rio Grande, would have been practically at the mercy of the Southern Pacific in the favorable or unfavorable treatment which might have been accorded to it in the matter of through business to be transported eastwardly.

The purpose of Congress to secure one permanent road to the coast, so far as physical continuity is concerned, is apparent,

but we do not think the acts stop with that requirement. It is provided that facilities as to rates, time and transportation shall be without any discrimination of any kind in favor of either of said companies or adverse to the road or business of any or either of the others; and the purpose of Congress to secure a continuous line of roads, operating from the Missouri river to the Pacific coast as one road, is further emphasized in the act of Congress of June 20, 1874 (18 Stat. Ill.), making it an offense for any officer or agent of the companies authorized to construct the roads, or engaged in the operation thereof, to refuse to operate and use the same for all purposes of communication, transportation, and travel, so far as the public and government are concerned, as one continuous line, and making it a misdemeanor to refuse, in such operation and use, to afford and secure to each of said roads equal advantages and facilities as to rates, time and transportation, without any discrimination of any kind in favor of or adverse to any or either of said companies.

Such practices of systematic and preconcerted discrimination as are said to have destroyed the Rio Grande's carrying trade as a connection for the east for business at Ogden, would have violated the statute as discriminations adverse to the Union Pacific and be equally violative of the letter and spirit of the acts of Congress. Certainly such discriminations could be restrained by the courts (*Union Pacific Railway Company vs. Chicago, Rock Island & Pacific Railway Company*, 163 U. S. 564, 603, 604) and might possibly have resulted in a forfeiture of all rights under the acts of Congress.

The obligation to keep faith with the government continued, as did the legislative power of Congress concerning these roads, notwithstanding changed forms of ownership and reorganization. (*Union Pacific Railroad Company vs. Mason City, etc., Railroad Company*, 199 U. S. 160.)

It is further contended that the real purpose in acquiring the stock was not to obtain the control of the Southern Pacific as a system, but to secure the California connection via Ogden and to avoid the situation which has been termed the "bottling up" of the Union Pacific at that point. That process, we have undertaken to show, might have been detrimental to the Southern Pacific business in California, as it is apparent that much of it would not have gone over the "Sunset" route of the Southern Pacific.

It may be conceded, as is undoubtedly the fact, that the connection at Ogden was a valuable one, the one practically and largely, if not exclusively, used in the transportation of freight to and from the state of California; but this case is not to be decided upon the theory that only so much of the Southern Pacific system as operates between Ogden and San Francisco has been acquired.

Conceding for this purpose that it might have been legitimate, had it been practicable, to acquire the California connection at Ogden over the old Central Pacific line, we must consider what was in fact done; and that was the purchase of the controlling interest in the entire Southern Pacific system, consisting of ocean and river lines with a mileage of about 3,500 miles, and railroad lines aggregating over 8,000 miles, together forming a transportation system from New York and other Atlantic ports to San Francisco and Portland and other Pacific coast points, besides a steamship line from San Francisco and Portland and other Pacific coast points, with various branches and connections, besides a steamship line from San Francisco to Panama and from San Francisco to the Orient, and a half interest in another line between the two latter points.

The purchase may be judged by what it in fact accomplished and the natural and probable consequences of that which was done. Because it would have been lawful to gain, by purchase or otherwise, an entrance into California over the old Central Pacific, does not render it legal to acquire the entire system, largely engaged in interstate commerce in competition with the purchasing road.

In determining the validity of this combination we have a right to look also to the intent and purpose of those who con-

ducted the transactions from which it arose and to the objects had in view. (*Swift & Co. vs. United States*, supra, 396; *United States vs. St. Louis Terminal*, 224 U. S. 383, 395.)

It appears that at the time the Union Pacific was about to raise the means to effect the Southern Pacific stock purchase, it authorized the issuance of \$100,000,000 of bonds "for the purpose of meeting present and future financial requirements of the company," provision being made for the use of the proceeds from \$40,000,000 of this amount in the purchase of the Southern Pacific stock, with no designation whatever as to the purpose to which the balance (\$60,000,000) should be applied.

It is said that the remaining \$60,000,000 was intended to be used in the acquisition of a part interest in the railroad system of the Chicago, Burlington & Quincy Railway Company in view of the imminent probability of the purchase of that system by the Northern Pacific Railway Company and the Great Northern Railway Company. As a matter of fact, the Northern Pacific and Great Northern, having each secured a half interest in the Burlington, the Union Pacific did acquire a large amount of the Northern Pacific stock with this \$60,000,000.

The failure to secure control of the Northern Pacific by acquiring a majority of its common stock resulted in the formation of the Northern Securities Company terminating in the litigation of the Northern Securities case and the judgment of this court reported in 193 U. S. 197. When that combination was declared illegal, the Union Pacific interests undertook to compel a return of the Northern Pacific stock which it had turned over to the Northern Securities Company, and opposed a distribution among the stockholders of the latter company of the stock of the Northern Pacific Company and the Great Northern Company, which had been put into the combination. That attempt was dealt with in *Harriman vs. Northern Securities Company* (197 U. S. 244), and of the effect of the return of the Northern Pacific stock to the Union Pacific interests, instead of the distribution of the stock and assets of the Northern Securities Company among its stockholders, this court said (P. 297):

"It is clear enough that the delivery to complainants of a majority of the total Northern Pacific stock and a ratable distribution of the remaining assets to the other securities stockholders would not only be in itself inequitable, but would directly contravene the object of the Sherman law and the purposes of the government suit.

"The Northern Pacific's system, taken in connection with the Burlington system, is competitive with the Union Pacific system, and it seems obvious to us, the entire road considered, that decree sought by complainants would tend to smother that competition."

In view of the testimony, we think the evident purpose of issuing the \$100,000,000 of bonds was to acquire a fund to be used for the acquisition of the stock of the Southern Pacific, a great competitive system, and also to acquire the stocks of other competing roads.

After acquiring the Southern Pacific stock Mr. Harriman, who dominated in the affairs of the Union Pacific, became president and chairman of the executive committee of the Southern Pacific Company, with the same ample power which he had in like positions in the Union Pacific Company and the companies owned and controlled by it. These facts cannot be lost sight of in determining the object and scope of the transaction in question, which resulted, as we have said, in that unified control, which has in its power the suppression of competition.

But it is said that no such control was, in fact, obtained: that at no time did the Union Pacific acquire a majority of the stock of the Southern Pacific, and that at first it acquired but 37 and a fraction per cent., which was afterward somewhat increased and diminished until about 46 per cent. of the stock is now held. In any event, this stock did prove sufficient to obtain the control of the Southern Pacific.

It may be true that in small corporations the holding of less than a majority of the stock would not amount to control, but the testimony in this case is ample to show that, distributed



as the stock is among many stockholders, a compact, united ownership of 46 per cent. is ample to control the operations of the corporation. This is frankly admitted in the testimony of Mr. Harriman, the prime mover in the purchase of the Southern Pacific. It was purchased, he declared, for the purpose of getting a dominating interest in the Southern Pacific Company, and, he added, the Union Pacific did thus acquire such interest.

Reaching the conclusion that the Union Pacific thus obtained the control of a competing railroad system and thereby effected a combination in restraint of trade within the meaning of the Sherman act, the question remains, What should be the relief in such circumstances?

The remedies provided in the statute, generally speaking, were said by this court in the Standard Oil case (*supra*) to be two-fold in character (P. 78):

"First: To forbid the doing in the future of acts like those which we have found to have been done in the past which would be violative of the statute.

"Second: The exertion of such measure of relief as will effectively dissolve the combination found to exist in violation of the statute, and thus neutralize the extension and continually operating force which the possession of the power unlawfully obtained has brought and will continue to bring about."

In applying this general rule of relief we must deal with each case as we find it, and in the present one the object to be attained is to restrain the operation of and effectually terminate the combination, created by the transfer of the stock to the Union Pacific Company.

In our opinion, the decree should provide an injunction against the right to vote this stock while in the ownership or control of the Union Pacific Company, or any corporation owned by it, or while held by any corporation or persons for the Union Pacific Company, and forbid any transfer or disposition thereof in such wise as to continue its control; and should provide an injunction against the payment of dividends upon such stock while thus held, except to a receiver to be appointed by the court, who shall collect and hold such dividends until disposed of by the decree of the court.

As the court below dismissed the government's bill, it was unnecessary there to consider the disposition of the shares of stock acquired by the Union Pacific Company, which acquisition, we hold, constituted an unlawful combination, in violation of the anti-trust act.

In order to effectually conclude the operating force of the combination, such disposition should be made subject to the approval and decree of the court, and any plan for the disposition of this stock must be such as to effectually dissolve the unlawful combination thus created.

The court shall proceed, upon the presentation of any plan, to hear the government and defendants, and may bring in any additional parties whose presence may be necessary to a final disposition of the stock in conformity to the views herein expressed.

As to the suggestion made at the oral argument by the attorney general in response to a query from the court as to the nature of the decree that one might be entered which, while destroying the unlawful combination, in so far as the Union Pacific secured control of the competing line of road extending from New Orleans and Galveston to San Francisco and Portland, would permit the Union Pacific to retain the Central Pacific connection from Ogden to San Francisco and thereby to control that line to the coast, thus effecting such a continuity of the Union Pacific and Central Pacific from the Missouri river to San Francisco as was contemplated by the acts of Congress under which they were constructed, it should be said that nothing herein shall be considered as preventing the government or any party in interest, if so desiring, from presenting to the court a plan for accomplishing this result, or as preventing the court from adopting and giving effect to any such plan so presented.

Any plan or plans shall be presented to the court within three months from the receipt of the mandate of this court, fail-

ing which or upon the rejection by the court of plans submitted within such time the court shall proceed by receivership and sale, if necessary, to dispose of such stock in such wise as to dissolve such unlawful combination.

The government has appealed from the decree, which is a general one, dismissing the bill. So far as concerns the attempt to acquire the Northern Pacific stock and the stock of the Atchison, Topeka & Santa Fe Railway Company, afterward abandoned, and a certain interest in the San Pedro, Los Angeles & Salt Lake Railroad Company and other features of the case which were dealt with and disposed of by the decree and opinion of the court below, it is sufficient, without going into these matters in detail, to say that as to them we find no reason to disturb the action of the court below; but for the reasons stated the decree should be reversed and one entered in conformity to the views herein expressed, so far as concerns the acquisition of the Southern Pacific stock.

Reversed in part, the Circuit Court to retain its jurisdiction to see that the decree above outlined is made effectual.

Justice Van Devanter took no part in the hearing or determination of this case.

### A CRITICISM OF RAILROAD HOSPITAL ASSOCIATIONS.

In an address before the American Association of Railway Surgeons at the LaSalle Hotel in Chicago on October 16, Dr. Frank Allport, of Chicago, severely criticized many of the railway hospital and relief associations.

He said he recognized the propriety of physicians working for corporations under a previously understood agreement, providing for the rendering of their services at reduced rates, but he objected to the insurance plan by which physicians are required to treat all sorts of diseases for the men, real or fancied, and advocated a stated rate of compensation for specified services. He continued, in part:

There has crept into railroad management, during the last few years, a desire on the part of a few railroads, under the excuse of philanthropy, to shift the financial burden of the injured employees onto the shoulders of the men themselves. Thus have come into existence the various hospital or beneficiary associations connected with a few of the roads that care for sick and injured railroad employees. The money for their support is raised by taxing each employee a certain sum (let us say 50 cents) a month, which is taken out of his wages. Thus, for \$6 a year he becomes insured against medical and surgical services for practically all diseases and injuries except those of a disgraceful character. These services the surgeons of the road are compelled to render for the small compensation which they receive. Under the ruling of some of these associations the men are compelled to accept membership, while in others this act is called voluntary, but it might as well be disclosed in its true light, for if a man does not join the association he is soon made to understand that he is *persona non grata*. In some of the associations the road is released from personal damage suits the instant that benefits are accepted; in others, this is not the case.

The management of the association and its finances is conducted practically by officers of the road; the low salaried men may, it is true, be represented on the board of management by one of their number, but it is reasonably certain that his influence will not be very far reaching.

These associations were originally planned for the benefit of the poor men, the low-salaried men of the road, but on at least one or two roads with which I am familiar, the high-salaried men from the president down have availed themselves of the privilege of membership, and I know of one high-salaried official who required and secured the performance of a laparotomy, under the \$6 a year clause. When placed upon the defensive the roads seek refuge under the claim that they hold themselves responsible for any deficit that may arise from time to time in the management of the fund; but as a matter of fact, it

may be said that the membership fees are so arranged that there is practically no deficit. In fact, on some roads there is a large surplus which, of course, is held in the hands of the management.

Most of the railroads that have adopted the Hospital Association plan voluntarily and ostentatiously contribute a few thousand dollars for its support; but even though this contribution is a large one (which it is reasonably safe to say it is not), it would almost surely fall far short of equalling the annual sickness, funeral and court expenses incidental to the old method of dealing with injured employees.

It will thus be seen that this adroit and ingenious scheme is a source of enormous saving to the road, as it almost, if not quite entirely, releases it from all financial obligations, so far as the care of its injured men is concerned. It can therefore be readily understood why some railroads are so enthusiastic over the plan, for under the ostensible purpose of benevolent and unselfish philanthropy, based upon the Samaritan-like desire to see that the poor employees are properly cared for when sick or ailing, and properly buried when dead, they have slipped in the clause that they shall be properly attended when injured in the service, and shall be properly examined for service from time to time, which lifts a great load of financial obligation from the back of the corporation. It can also be clearly comprehended why the men are satisfied, for by the payment of a small monthly assessment they are insured against practically all doctors', hospital and undertakers' bills, and are additionally compensated for the loss of an eye, a finger, a leg, etc.

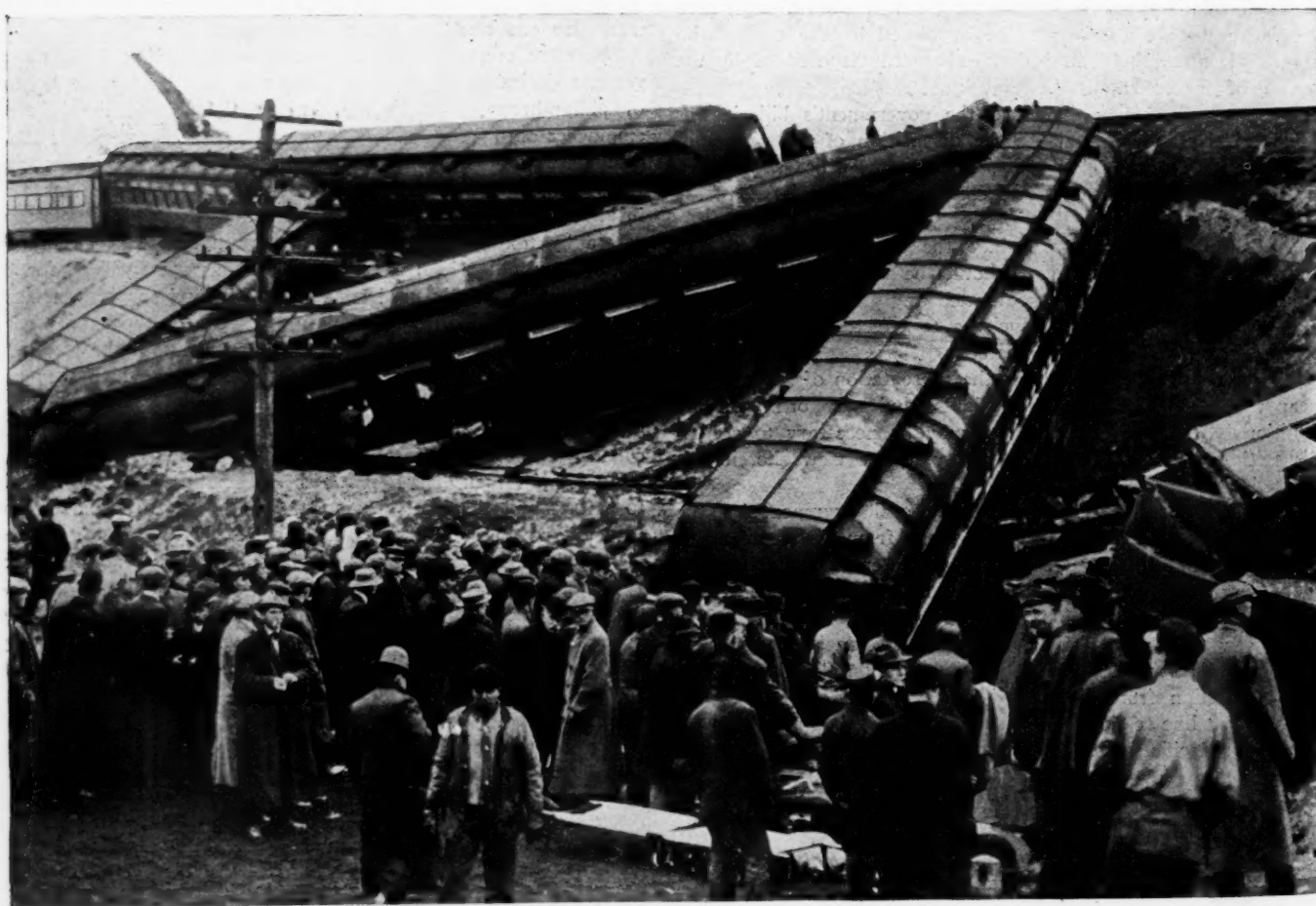
A distinct objection to the plan, however, must be mentioned in considering matters from the standpoint of the employee, consisting of the inferiority of underpaid work. Under the hospital association plan the doctor is almost invariably insufficiently paid for his work, for it must be remembered that under this

plan the doctor not only has to care for injuries received during service, but almost all other forms of physical disability as well. In view of the fact that his pay is ridiculously small and that he is constantly being consulted by the men for real or fancied diseases because it costs them nothing to secure his service, he is sure to become imposed upon, disgruntled and discouraged, and under these circumstances cannot enter heartily into his work, nor render his best services. Thus while the plan looks satisfactory to the insured man, he is reasonably certain sooner or later to receive unwilling and therefore inferior medical and surgical services.

Dr. Allport quoted from a report of the relief department of one railway, stating that the whole cost of its services, including company surgeons' salaries, fees paid other surgeons and hospital expenses, was \$1.85 per case. These cases involved operations of all sorts from the dressing of a bruised finger to double amputations or trephining.

### DERAILMENT AT GLEN LOCH, PA.

In the derailment of westbound passenger train No. 19, of the Pennsylvania Railroad, at Glen Loch, Pa., on the night of November 27, two passengers and two sleeping car conductors were killed and 49 passengers were injured. Eight cars fell down a bank about 20 ft. high and one steel sleeping car was badly crushed near one end by striking against the corner of a heavily loaded coal car standing on a track at the foot of the bank. The four persons killed were in the east end of this sleeping car. The train was derailed at a bridge, or just after passing over it. After the accident it was noticed that the bridge had sagged about ten inches, but the general manager's committee, making an investigation with a view to arriving at the cause of



*Part of Picture on Next Page.*

**Derailment of Passenger Train, No. 19, Pennsylvania Railroad, at Glen Loch, Pa., November 27, 1912.**





Bridge at Glen Loch, Pa.—North Side, Center Support.



Glen Loch Bridge, After Derailment.



*Part of Picture on Preceding Page.*  
Derailment at Glen Loch, Pennsylvania.

the derailment has not determined as yet whether this sagging was the cause or the result of it.

The train consisted of two locomotives, a postal car, a baggage and smoking car, one day car, and nine sleeping cars. The engines and first two cars remained on the roadbed and the two rear cars of the train did not leave the track. All of the cars were of steel and, except as above, the car-bodies were not seriously crushed or distorted.

The situation of the five sleeping cars which suffered most severely, as they appeared immediately after the accident, is shown in the large photograph reproduced herewith. At the right of the picture may be seen the coal car which was the cause of the serious crushing of the sleeping car in which the four persons were killed.

One of the two smaller pictures shows the point where the bridge failed, and the other the appearance of the track at this point after the train had passed over it. The bridge that failed was a plate girder, the girders being 71 ft. 6 in. and 66 ft. 3 in. long on the north side and 84 ft. 6 in. and 75 ft. 6 in. long on the south side; and 7 ft. deep. It spanned the tracks of the Trenton cut-off, the cut-off tracks running from northeast to southwest, assuming that the main line runs from east to west. The west end of the east span and the east end of the west span rested on a box girder 17 in. wide and 24 in. deep, and this in turn was supported by a row of vertical latticed columns 12 in. x 12 in., resting on a stone pier which stands between the tracks of the cut-off. The pairs of columns are braced diagonally, with angle-iron braces, as shown. The failure occurred at the head of the righthand column, looking west, and the bridge floor sank about 10 in., as shown.

### AUTOMATIC BLOCK SIGNALS ON LAKE SHORE SINGLE TRACK.

The Lake Shore & Michigan Southern has recently put in service automatic block signals on its Michigan division between Elkhart and White Pigeon, 19 miles, single track, and the circular issued to trainmen when the signals were put in use was accompanied by a diagram, a reduced copy of which is shown herewith, illustrating the way in which the signals work by means of five typical situations of two trains, a westbound and an eastbound, approaching a meeting point.

The signals are three-position upper quadrant. At the meeting point the signal set just beyond the outgoing end of the passing track has a square end blade with the lights arranged vertically (13 ft. centers), the indication thus being absolute stop. The signals at the entrances to the passing tracks and all signals between stations have blades with pointed ends and have the lights arranged diagonally (7 ft. centres).

The meeting points are at Morehous, four miles from Elkhart,

at Bristol 8 miles and Vistula 13 miles. The distances between these stations are as indicated, and the number of blocks between stations is, eastbound, as follows: Three, three, four, four. Westbound, it is the same.

For protection against opposing trains the signals are arranged so that each block extends from one passing track to the next; and the indications of the signals having pointed blades, between stations, are the same as they would be on double track; that is to say, an engineman encountering such a signal indicating stop may proceed after having stopped, excepting to find a train, an open switch, or a broken rail, except when proceeding under protection of flag from the last absolute block signal.

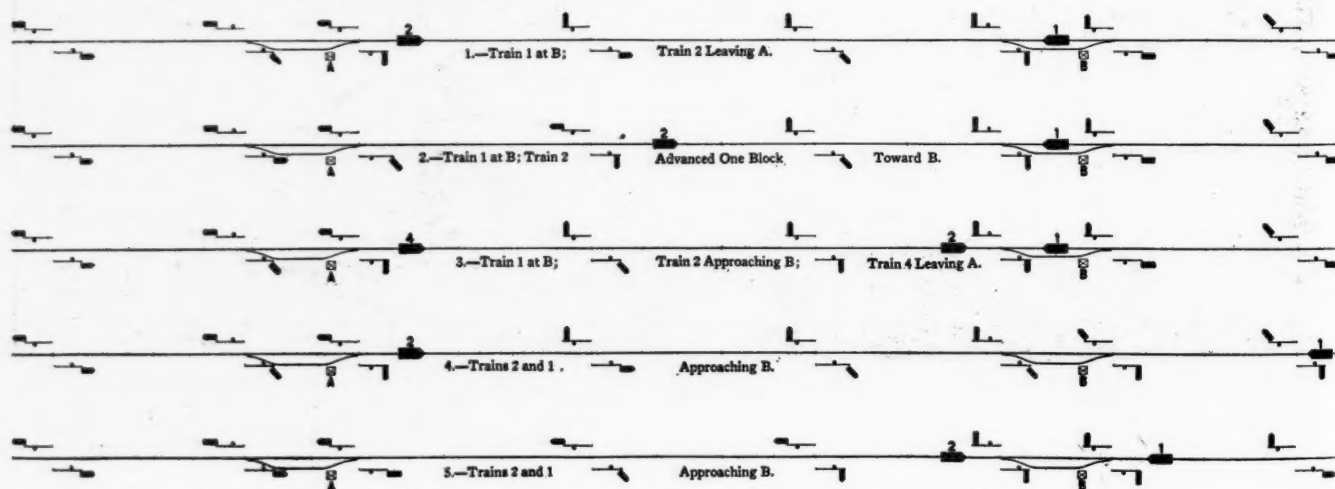
When an absolute signal is found at stop and it remains in that position and if there be no operator on duty there and the train despatcher cannot be reached by telephone, it can proceed only under protection of flag and under control to the next block signal which it finds in the proceed or the caution position. There is a telephone, on the despatcher's circuit, near each absolute block signal.

When an absolute signal indicates stop, an approaching train must be stopped three hundred feet in the rear of the signal so as to clear the passing track.

The switchstands on this piece of road are seven feet high, the high switchstands formerly in use having been taken down.

A preliminary statement of the number of poles purchased during 1911 has just been issued by the Census Bureau of the Department of Commerce and Labor. It shows that of the total of 3,418,020 poles 227,647, or 6.7 per cent., were purchased by the steam railways.

**IMPORTANT LINE FOR PERU.**—In the latter part of 1911 was completed a preliminary field survey of the Oroya-Tarma-Port Werthman Railway, which is to start from a point on the Central Railway of Peru near Oroya and descend through Tarma, La Merced, and the Chancha Mayo country to the Perene colony of the Peruvian Corporation on the Perene river, and eventually to deep water on the Ucayali river. The German house of Arthur Koppel made the survey under a contract with the Peruvian government, and it is generally understood that the Peruvian Corporation has an interest in the execution of the work. The Chancha Mayo valley yields a considerable quantity of first-class coffee, rum, and products like annatto (a vegetable dye,) fruits, medicinal and tanners' barks, cacao, coca leaves, and some cotton. The projected road should enable the country to develop its timber for construction work in the Sierra, as well as for export, and the vegetable ivory, or tagua nut, industry might also be made profitable. The road would also form an important link in the connection of the waters of the Pacific with those of the Atlantic through the navigable rivers of the Amazon district.



Instruction Sheet, Automatic Block Signals on Single Track; Lake Shore & Michigan Southern.



# NOTES ON FRENCH RAILWAY PRACTICE.

Based on a Visit to the Locomotive and Car Repair Shops  
of the Paris, Lyons & Mediterranean Railway at Paris.

By HENRY W. JACOBS.

The Paris, Lyons & Mediterranean Railway is the largest in France, having over 6,000 miles of line and operating 3,300 steam locomotives, 273 electric vehicles, 18 steam railway motors, 7,000 passenger cars and 97,000 freight cars. It extends south from Paris to the Mediterranean, as its name indicates, and has practically a monopoly of the through traffic of all central and south-eastern France. It is larger than any English railway and has three main repair shops, the principal one being near Lyons and another older one at Paris. I had an opportunity of visiting the latter. I had heard so much of the small size of European trains and locomotives that I was much surprised to find in the service of the Paris, Lyons & Mediterranean Railway some modern heavy express locomotives that would be a credit in weight and capacity to almost any American railway. I refer particularly to a superheated steam Pacific type locomotive that was undergoing general repairs at the Paris shops.

As in England, there is a departmental organization with a mechanical department called "equipment and traction." This has at its head an honorary engineer-in-chief, an engineer-in-chief and an assistant, besides separate officers in charge respectively of locomotives, cars, and electric installations, together with three shop superintendents, three engineers in charge of locomotive operation, including round-houses and enginemens, besides eight district men subordinate to these three. The engineer-in-chief has a further staff, consisting of a chief clerk, chief accountant, engineer-in-charge of outside work, chief of laboratory, engineer of tests, engineer in charge of stores, and chief in charge of fuel.

The Paris shops make about 100 general locomotive repairs a year and have a general foreman in charge, as in America. The equipment is not nearly as modern as at Crewe, England, but it was explained that the Paris shops were shortly to be vacated entirely for any except light repairs, and that, therefore, it was not worth while to put in any modern machinery and tools. It was rather a surprise to note an engine belted to the shafting with an 1855 date plate on it in the main machine shop. In contrast to the old and slow moving machinery were the modern emery grinders which were even equipped with signs stating to what speeds the wheels should be tested, operated and at what diameters they should be removed. This, of course, represents the best practice.

## SPEED RECORDERS ARE USED ON THE LOCOMOTIVES.

It is apparent that the French retain machinery in service much longer than is practiced with us or with the English, and beyond the time when it should be obsolete. This is all the more surprising because of the great mechanical ingenuity of the French, as is witnessed in refinement of design of the various locomotive parts, particularly valve arrangements. Many examples of such ingenuity I was particularly impressed with, including the speed-recording device which is applied apparently to all express locomotives. I counted forty of these devices under repair in the tool room attached to the Paris shops. The application of these speed-recorders to express locomotives is undoubtedly a good thing and should find greater favor in this country. Only on two or three progressive American roads, that I know of, have speed-recorders been generally introduced.

Again, in France, as in England, I was impressed with the great superiority of the plate frame over the bar frame, which is exclusively used in America. It seems that some years ago ten locomotives with bar frames were acquired by the Paris, Lyons & Mediterranean. All of these frames gave trouble by continued breaking and had eventually to be replaced by plate frames. I was given a vivid description of

the sinuous yielding of the bar frame to the stresses to which the locomotive is subjected; the deep plate girders are, of course, absolutely rigid. The plate frames are punched out for the frame jaws and frame fittings and then slotted ten at a time, as in England. This is a rather slow and expensive operation which seems destined to be superseded by a method now adopted in some of the locomotive building works, viz., of cutting the frame jaws, etc., out closely to dimensions with the oxy-acetylene blowpipe. There was no question but what this method gives a reduction in the cost of manufacture.

## FRENCH LOCOMOTIVES ARE WELL BALANCED.

Many of the smaller and older locomotives are of the inside cylinder crank axle type, like those in England. The heavy modern express locomotives of eight-wheel, Atlantic and Pacific types, usually have four cylinders of the same size, if simple; the inside cylinders are low pressure, if compound. The newer passenger locomotives are mostly either compound or superheater of the Schmidt type.

The four-cylinder arrangement, whether simple or compound, undoubtedly gives a better balanced locomotive and to this question of mechanical balance the French evidently give careful attention. For the turning of the journals and inside crank bearings of the cranked axle drivers a special machine about the size of a quartering machine or driving wheel lathe is used. This is massive and rigid and does good work, but is operated very slowly, as indeed seems to be the case with most of the machines I saw running.

I was favorably impressed with the very accurate scale on which all passenger car wheels are weighed and rotated to determine their balance. Only 750 grammes (1.65 lbs.) eccentricity of weight is permitted in a pair of coach wheels. This is done, I was informed, to make the cars smooth running and avoid complaints of passengers. In this, as in the case of speed-recorders, we might do well to tear a leaf from European experience. While slight eccentricities in coach wheels do not affect our heavy car construction to the extent that a similar eccentricity would affect the light cars in use in Europe, for the balancing of a locomotive, some such device should undoubtedly be used. We are well aware that many an epidemic of rail failures is due to improperly balanced engines.

Among other refinements of locomotive design and operation are the two-stage air pump, the air cylinders being arranged as a steeple compound, the universal use of the variable nozzle to suit the sharpness of the draft to the steam demands of the locomotive; and the cutting down of wind resistance by changing the shape of the cab. One was again impressed in the care exercised in annealing and heat treating of side and main rods and all reciprocating parts, and in the light sections of the pistons.

The passenger car journals after being turned are coated with oil and then tied up with straw to protect against the weather and against being burred in handling. All of this careful attention to the mechanical balance and the working parts of the locomotive undoubtedly contributes to the wonderful smoothness and quietness with which these engines run. While standing near the track, an express train came by at full speed, but there was no clanking of the locomotive; more slowly there moved into the roundhouse one of the big Pacific type engines, but it ran with a softness of a well-made automobile, there being no signs of rod play or working journals. The renowned quietness with which trains start out of the station throughout Europe is due partly to this smooth working of the locomotive, as well as to the care with which the locomotive is handled by the engineer. It is also

due in a large part to the way in which trains are coupled up. The coupling principle is quite different from that used in America, the right-and-left hand screw coupling being universally used. This coupling seems to have become standard thus permitting interchange of equipment over all lines; the screw coupling is also used on freight cars on the Continent of Europe, while the link and hook is still used on the freight cars of Great Britain.

The cars on a passenger train are coupled together as follows: On either side of the end sills of the underframes are spring buffers. The screw coupling does not connect to the car through any spring. The cars are thus screwed together in a state of compression against these spring buffers throughout the length of the train, instead of being in a state of tension as with our American coupling. With the very light equipment this principle works very well and there is not the familiar taking-up of slack in the starting of a train that we experience in America.

#### AUTOGENOUS WELDING.

The Paris, Lyons & Mediterranean mechanical officials have given the subject of oxy-acetylene welding a great deal of careful and detail study. Wherever it is feasible to apply the process economically it has been developed. The seams of casings of all kinds are welded together instead of being riveted; defective and worn castings are filled out so as to be usable; crank axles are repaired, and even light and heavy parts that have been broken are welded together. Similarly the oxy-acetylene process has been used to a large extent in work on the frames and brake rigging of cars. As at Crewe, in England, I found that the practice of safe-ending flues was to braze the ends on; in the last year this practice has been discontinued in favor of oxy-acetylene welding. The safe end is butted to the flue and welded, while turning slowly in a machine like a flue cutting-off machine. I was told that this gave an extremely good weld and that there are no failures in flues at the weld, the weld being actually stronger than the rest of the flue. My observation, both of the manner of actually doing the weld, and of the finished flues confirm this information, and later I had the opportunity of seeing welded flue sections at the Königliche Technische Hochschule in Cologne. In addition, I was told that great savings had been made in the Paris shops in the restoration of flues wherever they had pitted. The process was to clean the flues by thoroughly rattling after which they were examined for any pits and cracks and these were filled up by the oxy-acetylene welding process.

The Servé tube is in quite general use. These are  $2\frac{1}{2}$  in. inside diameter, and are provided with longitudinal ribs or flanges extending inward radially for about  $\frac{1}{2}$  in., there being about 6 or 7 such ribs in each flue. These ribs extend lengthwise parallel to the axis of the flue, and are not spiralled; the advantage claimed for them is that the extra metal in the flanges takes up more of the heat as the gases pass through the flues, conducting this heat to the flue walls and into the water of the boiler, thus giving a higher rate of evaporation per square foot of flue surface than the plain flues. However, I am informed that the actual thermal advantages are slight, and that the construction has given rise to practical objections in the way of the flues tending to clog up easily with soot and cinders, being therefore more expensive to clean out. The theoretical increase in evaporative efficiency is not obtained, and the higher first cost is not warranted.

#### COPPER AND BRASS USED EXTENSIVELY.

Again, as in England, I observed the use of copper for fire-boxes and staybolts. I was informed that on the newer locomotives a fine quality of manganese bronze was used in the fire-boxes and the flue sheets. The large fire doors are divided into three sections, only one being swung inwardly and upwardly at a time, admitting only one-third of the quantity of cold air and permitting the distribution of coal (or briquettes) to the right, left or middle, according to the section of door used.

Another use of brass unusual in America was in connection with the jackets. These brass parts are not polished as they used to be when they were used on American railroads in the days of red-painted driving wheels and landscape-painted tenders. The French jackets, like the English, are carefully painted, although the engines do not present the harmonious simplicity of appearance and color which makes British locomotives famous.

#### METHOD OF PAYING SHOP MEN.

Throughout all of the locomotive repair operations, although the men are guaranteed their day's wages, the pay is proportionate to the amount of work turned out, this practice seeming to be much more generally employed, both on the Paris, Lyons & Mediterranean and at the great Crewe shops than we find on many American railroads. There were evidences on every hand of painstaking and careful workmanship, a workmanship which made itself felt later in the nice working of the locomotive and in the enormous mileages obtained from the locomotives. The superintendent of the Paris shops told me that the engines coming to him for repair average between three and four hundred thousand kilometers between repairs. This is equivalent to over 200,000 miles, and is a most creditable performance.

Notwithstanding the fact that the mechanics were working under a stimulative method of pay their movements seemed to be very listless and leisurely, not compared with the activity of the American or English workers. I would attribute this condition in part to the fact that smoking was permitted while the men were at work. Perhaps also the influence of the form of trade unionism practiced in France had a restrictive effect on output. I was told that about one-third of the men were organized, although the organization did not have any agreement with the company as such, but was secret on the part of the men. A peculiar form of trade unionism has originated, known as syndicalism. The belief of the syndicalists is that each industry should be owned and operated by the workers in that industry, the foreman and other officials necessary to direct the operations being elective like the legislative and administrative bodies of a municipal, county or state government. The method of possible compensation to the present owners of these industries has as yet not found a place in the syndicalists' programme.

The men work from 6:45 in the morning to 11:45. After  $1\frac{1}{2}$  hours for lunch they work from 1:15 to 6:15, making a 10-hour day. The clerical forces at the shops work 2 hours less, quitting an hour earlier in the morning and also in the afternoon. The men are paid in cash twice a month.

While the drinking of ales, beers and light wines is general among all classes in Europe, there seems to be in France a resentment against excessive thirst for alcohol.

#### ENGINE HOUSE DESIGN IS PECULIAR.

The roundhouses are similar to those in America except that they are built on a smaller circle. However, the entire turntable pit is covered by a circular platform that turns with the turntable. This practice is true also of England, and has the advantage that material can be trucked across the platform from any direction, the whole space between the rails and the radial roundhouse tracks being paved so that this trucking may be done. The covering of the turntable pit will further appeal to anyone who has had any experience in running a roundhouse, as men often fall into the pit, especially at night, and from the point of view of safety alone the expense of the covered pit would seem justifiable.

In another respect also, these French roundhouses differ from those in the United States, in that they are roofed over completely in the centre. Where good smoke jacks are used these covered roundhouses are quite as free from smoke and gases as our open roundhouses, and give much greater protection to the men in the winter time, although the winters in France are not nearly so severe as those experienced by our northern railways. One interesting feature of the roundhouse was the little clock tower surmounting its roof. It was of graceful, though archaic design, and showed the French love for architectural embellishment even on a roundhouse.



# THE HOPATCONG-SLATEFORD CUT-OFF.

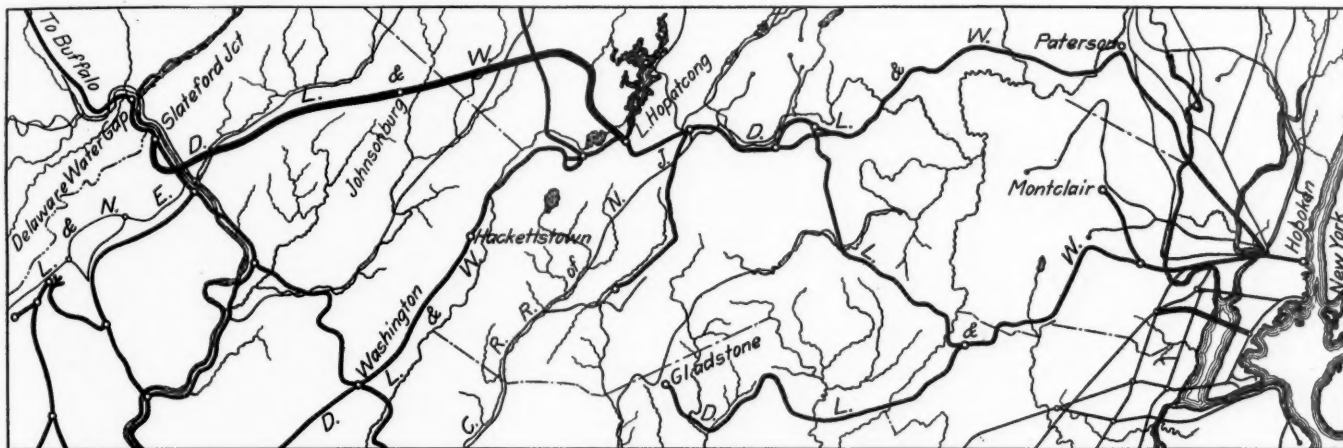
This Recently Completed Lackawanna Line Which Embraces  
Some of the Heaviest Railway Work Ever Done in this Country.

By C. W. SIMPSON,  
Resident Engineer, Delaware, Lackawanna & Western.

The recently completed Hopatcong-Slateford cut-off of the Delaware, Lackawanna & Western, a preliminary description of which was published in the *Railway Age Gazette* of August 14, 1908, was opened to traffic on December 24, 1911, and has been in continuous operation since that date. The double track main line of the Lackawanna extends from Hoboken, N. J., through Scranton, Pa., to Buffalo, N. Y., passing through the Blue Ridge mountains at the famous Delaware Water Gap, and

The object of the cut-off is the elimination of this detour, together with a large amount of curvature and heavy grades.

An average of 20 passenger and milk trains and 35 freight trains pass over this portion of the line daily, about 55 per cent. of the freight trains being slow trains and the rest manifest. The tonnage eastbound is very largely in excess of that westbound on account of the large number of coal, refrigerator and stock cars returning westward empty. For this reason the



The Hopatcong-Slateford Cut-Off of the Delaware, Lackawanna & Western.

which is a controlling point. By an inspection of the accompanying map it will be seen that a straight line between Hoboken and the Delaware Water Gap intersects the railroad near Landing station, at the south end of Lake Hopatcong. Between this point and the Delaware Water Gap the old road, following the lines of least resistance from a construction viewpoint, makes a wide detour to the south, passing through Washington, N. J.

saving on westbound traffic results mainly from reduction in distance as compared with the reduction in grade for eastbound traffic.

## ALINEMENT AND GRADIENT.

The new line branches from the old about a quarter of a mile west of Landing station, crosses the Morris canal on a steel bridge, the only steel structure on the new line, and immediately



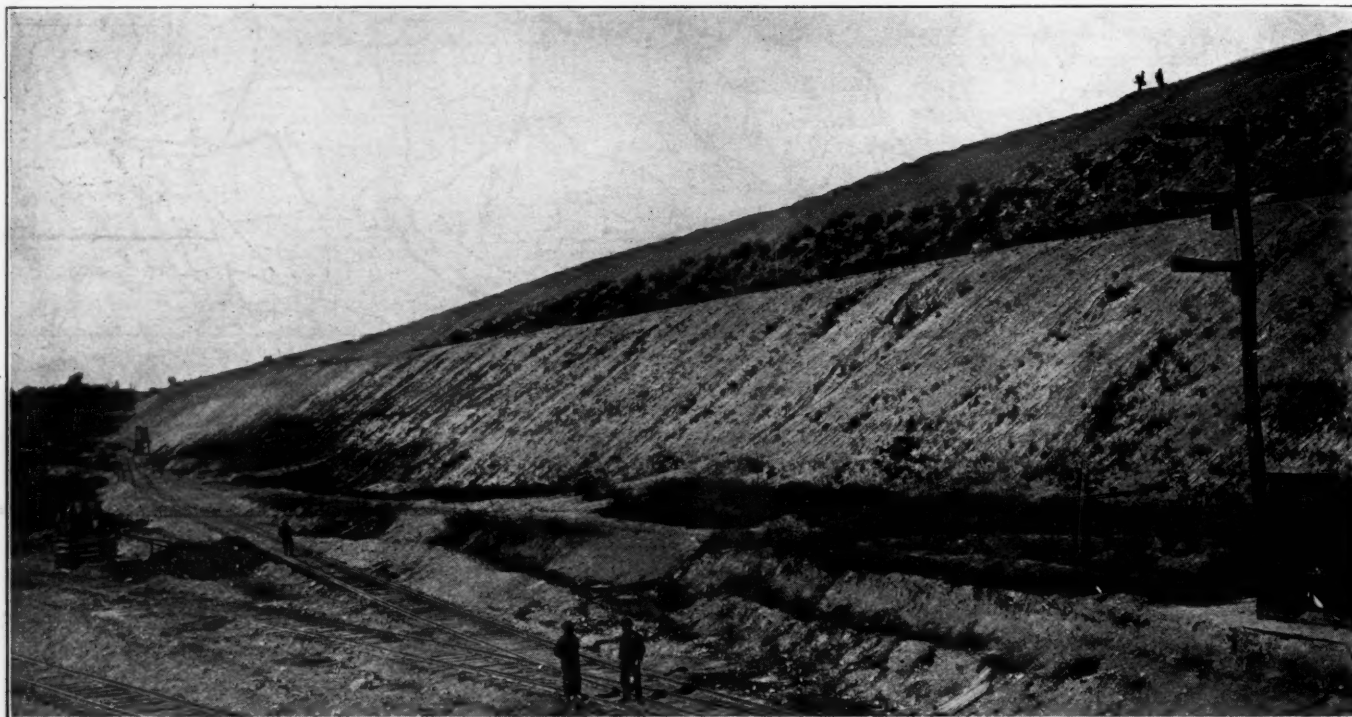
Suspended Track Used for Making Fill on Section 5.

begins to descend on the maximum gradient of 29 ft. to the mile, compensated. A few hundred feet beyond the canal the line crosses the Musconetcong river and then passes the divide between this river and the Lubber Run creek in a cut a little more than one mile long and about 55 ft. deep. For 1,100 ft. of this distance the cutting was about 30 ft. below the water surface of a swamp. Continuing the 29 ft. grade the line runs northward along the eastern slope of the Lubber Run valley, then swings to the northwestward, crosses the valley on an embankment 98 ft. high, containing more than 1,000,000 cu. yds. of material, and crosses the divide between the Lubber Run creek and the Pequest river through heavy granite cuts, aggregating 900,000 cu. yds. and a tunnel 1,000 ft. long. At the tunnel the grade line is 132 ft. below the surface. It was the original intention to take out an open cut, but when the cut was opened it was found that the hard rock strata, which pitch sharply, were separated by thin beds of a softer material which showed indications of rapid weathering. The tunnel was therefore resorted to in order to avoid the possibility of slides during the construction period and subsequently.

on this grade to its junction with the old line at Slateford, Pa. After crossing this divide the line lies high up on the south slope of the Paulins Kill valley, affording a magnificent view across this beautiful valley to the Kittatinny mountains, with the Delaware Water Gap in the distance.

The Paulins Kill river and the N. Y. S. & W. are crossed at Hainesburg, N. J., on a concrete arch viaduct, the top of rail being 120 ft. above the stream bed. About two miles west of Hainesburg the line crosses the Delaware river and the old line of the D. L. & W. on a series of concrete arches; swings to the north on a 3 deg. 36 min. curve, the only curve exceeding 2 deg. on the entire line, and joins the old line at a point about one mile from the river crossing. The junction point is Slateford, Pa., a small village on the west bank of the Delaware river about three miles below the Delaware Water Gap.

The cut-off is 28.45 miles long, being 11.12 miles shorter than the old line. The maximum gradient is 0.55 per cent. compensated 0.03 per degree of curvature. There is one 3 deg. 36 min. curve, all other curves being 2 deg. or less. All curves sharper than 1 deg. are connected with tangents by spirals. The follow-



West End of Pequest Fill Showing Switchbacks on Inclined Benches in Side of Fill.

Swinging further to the westward over a 2 deg. curve and running almost due west the line crosses the Pequest valley on an embankment three miles long, this fill being 106 ft. high at the river and averaging about 70 ft. in height for the entire three miles. This embankment, which is said to be the largest railroad embankment in America, required about 7,000,000 cu. yds. of material. Several entire farms were purchased to provide borrow pits. The embankment is pierced by seven independent arch structures—two for railroads, four for highways, and one double-barreled arch carrying the Pequest river. From the west end of this embankment, which is the end of the 29 ft. grade, the grade is level for six miles, excepting a rise and fall of 16 ft. on a 0.3 per cent. grade, introduced to drain a long rock cut. The alinement across the Pequest watershed consists of one tangent seven miles long and one tangent three miles long separated by a 30 min. curve having a central angle of 6 deg. 30 min.

The divide between the Pequest and Paulins Kill watersheds is crossed through a cut 4,700 ft. long and 90 ft. deep, requiring the excavation of 810,000 cu. yds. of slate rock. At this point the 29 ft. grade is resumed and the line continues downward

ing table shows a brief comparison between the old and new lines.

COMPARATIVE SUMMARY OF PHYSICAL CHARACTERISTICS OF OLD AND NEW LINES.

	Old Line.	New Line.	Saving.
Distance .....	39.57 miles	28.45 miles	11.12 miles
Maximum grade.....	1.14% = 60.19 ft. per mile	0.55% = 29.04 ft. per mile	31.15 ft. per mile
Number of curves.....	57	15	42
Maximum curves.....	6° 54' { 22 are 4° or greater	3° 36' { One 3° 36'; others 2° or less.	3° 18'
Total degrees of curvature .....	1,999°	439°	1,560°
Rise and fall.....	248 ft.	16 ft.	232 ft.
Degrees per mile.....	50° 31'	15° 26'	35° 05'
Length in tunnel.....	3,971 ft.	1,000 ft.	2,971 ft.

The double-track roadbed is built 33 ft. wide on embankments and 41 ft. wide in excavations, providing a 4 ft. ditch on both sides. All embankment slopes and excavation slopes in earth are 1½ horizontal to 1 vertical; excavation slopes in rock are ½ horizontal to 1 vertical.

The construction of the roadbed and bridges was contracted, and the track, signals and station buildings were built by the railroad company with its own forces. Roadbed excavation was



divided into two classes only, earth and rock; and no overhaul was allowed. All rock not in its natural bed and less than 1 cu. yd. in size was classified as earth. The quantities of material moved were 7,943,500 cu. yds. of earth and 6,547,000 cu. yds. of rock. At one time there were 31 steam shovels at work, varying in size from 55 to 80 tons.

There are no grade crossings either of railroads or highways. All railroad crossings are undergrade and all highways either under or over. All structures are of concrete excepting the bridge over the Morris canal near Hopatcong. Including railroad, highway and steam crossings there are 67 structures containing 266,235 cu. yds. of concrete and 2,438 tons of reinforcing steel. The most important structures are the Delaware river bridge, composed of five 150 ft., two 120 ft. and two 54 ft. arch spans, containing 51,376 cu. yds. of concrete and 627 tons of reinforcing steel, and the Paulins Kill viaduct composed of five 120 ft. and two 100 ft. arch spans, containing 43,212 cu. yds. of concrete and 735.5 tons of reinforcing steel. The Delaware river bridge is 1,476.8 ft. long, end to end of masonry, and has been said to be the largest concrete railroad bridge in America.

ground surface a few feet beyond the required roadbed width. The contractors decided to blast this entire cut, containing about 30,000 cu. yds. with one shot. A tunnel 85 ft. long was driven at right angles to the center line until it reached the inside ditch line. The tunnel was then continued at right angles along the ditch line and in both directions from the first tunnel—65 ft. in one direction and 25 ft. in the other. At the point where the first tunnel crossed the center line other laterals were run at right angles for about 25 ft. in each direction. The tunnels were loaded with 21,000 lbs. of Judson powder and 12,000 lbs. of dynamite. The blast was entirely successful, about 15,000 cu. yds. of rock being thrown entirely clear of the roadbed.

Section No. 3 was 3.9 miles long and required the excavation of 2,664,582 cu. yds. of earth, 887,469 cu. yds. of rock and 1,000 lin. ft. of double-track tunnel. Seven concrete structures required 31,636 cu. yds. of concrete and about 160 tons of reinforcing steel.

The rock on this section was a very hard, so called New Jersey granite. The Pequest fill, about 45 per cent. of which was included in this section, is divided by a high pinnacle of rock



Rock Cut on Section 6 Showing Character of Rock Encountered; Delaware, Lackawanna & Western.

The other structures vary in span from 3 ft. culverts up to 65 ft. spans; the length of barrel varying from 25 ft. for some overhead highway bridges, to 360 ft. for some of the stream crossings. The maximum height of fill over any such crown is 89 ft. These structures will be described in more detail in a later issue of this paper.

#### CONSTRUCTION FEATURES.

For construction purposes the work was divided into seven sections. Section No. 1 was 2.7 miles long and included the excavation of 278,750 cu. yds. of earth and 551,743 cu. yds. of rock. Six structures required 14,250 cu. yds. of concrete and about 75 tons of reinforcing steel.

Section No. 2 was 2.3 miles long and required the excavation of 79,285 cu. yds. of earth and 835,218 cu. yds. of rock. In the five concrete structures 10,660 cu. yds. of concrete and about 43 tons of reinforcing steel were used. At one point on this section the center line lay along a steep side hill, crossing a sharp rock projection. The ground line on the center line profile ran from grade up to 53 ft. cutting and down almost to grade in a distance of 160 ft. The cutting on the high slope was about 70 ft., and on the lower side the plane of the subgrade cut the

extending to within 12 ft. of subgrade about 2,400 ft. from the east end. This portion of the fill is about 100 ft. high and the high point above mentioned made it practical to employ a suspended track. Two 2¼ in. cables placed 12 ft. apart were supported on a 60 ft. tower on the east end, and a 135 ft. tower on the west end. A 150 ft. tower near the center divided the cables into two spans of 1,000 ft. and 1,200 ft. A 3 ft. gage track was suspended from the main cables by means of hangers, spaced 12 ft. apart longitudinally, carrying 10 in. x 10 in. x 14 ft. floor beams on which rested 10 in. x 10 in. x 16 ft. stringers. The hangers consisted of a 7⁄8 in. wire rope suspended from the main cable by means of a yoke of ½ in. x 8 in. U shaped plates riding on a cast saddle. The yoke could be clamped to the main cable by means of two ¾ in. bolts, and the suspended rope was attached by a 7⁄8 in. link and pin. A tackle consisting of 10 in. double blocks rove with a ½ in. wire rope was attached to the suspended rope and carried the floor beam by means of an eye bolt passing through it. The hangers were kept at the proper spacing by means of ¾ in. wire ropes running from hanger to hanger and clamped to the yokes. To prevent excessive movement in the main cables while dumping,

a timber tower about 30 ft. high was placed under the main cables near the head of the bank and moved ahead as the filling progressed. To prevent the entire system of hangers from moving a large clamp was fastened to each main cable just ahead of the rear yoke or just behind the forward yoke, according to the incline of the main cables. The track rails prevented the floor from moving longitudinally. The cars were dumped at the top of the bank and the empties run out on the suspended track. The cradle was 120 ft. long, which provided for an eight car train and the advancement of the head of the bank for 30 ft. A bridle was attached to the  $\frac{3}{8}$  in. spacer ropes and a wire rope connected the bridle with a winding drum near the west end. The cradle was moved by loosening the clamps on the main cables, cutting the track and pulling ahead with the winding drum. The track was then connected up, the hanger lengths adjusted by the tackle, and the stiffener tower moved ahead. The hanger lengths were adjusted so that the unloaded cradle presented an up grade to the approaching train. When loaded with eight empty cars the suspended track was about level. About 800,000 cu. yds. of material were placed by means of this track.

Section No. 4 was 4.5 miles long, and included the excavation of 4,130,923 cu. yds. of earth and 345,658 cu. yds. of rock. Ten concrete structures required 43,264 cu. yds. of concrete and 389 tons of reinforcing steel. This section included about 55 per cent. of the Pequest embankment, which was placed by raising track as the embankment progressed. Tracks leading from the borrow pits were carried to the top of the embankment in inclined benches on the side of the embankment. These inclines were on a 1.5 per cent. grade, which allowed the 50-ton locomotives to haul nine 12 yd. cars. The benches were filled from the top with material taken from the cuts near the west end of the embankment.

Section No. 5 was 6.4 miles long, and included the excavation



Typical Concrete Signal Tower; D. L. & W.

of 492,771 cu. yds. of earth and 1,881,863 cu. yds. of rock. In the fifteen structures there are 21,233 cu. yds. of concrete and 188 tons of reinforcing steel. Two of the embankments on this section were made by the use of a suspended track, similar, in general principle, to that previously described. Two  $2\frac{1}{4}$  in. cables spaced 12 ft. apart were supported on a timber tower at the west end and a steel tower at the east end. The steel tower was so designed that the train ran between its legs on to the suspended track. The 3 ft. gage track was supported on two 4 in. x 10 in. stringers under each rail resting on 10 in. x 10 in. floor beams which were suspended from the main cables by block and tackle hangers. The hangers were spaced 12 ft. apart and were kept at the proper spacing by two  $\frac{1}{2}$  in. x  $4\frac{1}{2}$  in. iron straps running from hanger to hanger immediately

below the main cables. Each hanger was suspended from a 6 in. sheave which rode the main cable, by two  $\frac{1}{2}$  in. x  $3\frac{1}{2}$  in. x 14 in. straps carrying a  $\frac{7}{8}$  in. link and pin from which the upper hanger block was suspended. The spacer bars were attached to these straps. The cradle was kept in place by guys from the inner end of the spacer bars to the base of the steel tower, by clamps on the main cable and by the rails of the track.

In order to complete the work within the contract time it



Firing a 16½-Ton Blast on Section 2.

was necessary to haul material from one cut around several other cuts. This entailed lowering the material about 150 ft. within a short distance. To accomplish this the contractor constructed a double track inclined plane about 1,200 ft. long on a 12.5 per cent. grade. A 1 in. cable was wound on two 6 ft. cable drums keyed to one shaft. The speed was controlled by friction bands operated by hand levers. Eight 4 yd. cars were handled as a unit, and no power was required, as the load going down hauled the empties up.

Section No. 6 was 5 miles long and required the excavation of 55,941 cu. yds. of earth and 1,523,513 cu. yds. of rock. This section included the Paulins Kill viaduct. In addition to the viaduct there were twelve concrete structures requiring 25,988 cu. yds. of concrete and 108.5 tons of reinforcing steel.

Section No. 7 was 3.6 miles long, requiring the excavation of 241,210 cu. yds. of earth and 485,335 cu. yds. of rock excavation. In addition to the Delaware river bridge, which was included in this section, there are ten other structures containing 24,616 cu. yds. of concrete and 112 tons of reinforcing steel.

#### TRACK AND SIGNALS.

Sections No. 6 and 7 were the first to be completed, permitting the track work to be commenced from the connection with the old line at Slateford, Pa. A short time later sections Nos. 1 and 2 were finished and track laying was started at the east end also. The main tracks were laid with 101 lb. 33 ft. rails on 7 in. x 9 in. x 8 ft. 6 in. creosoted ties, using screw spikes with standard screw spike tie plates. Two spikes were used in each plate except on the sharper curves where the track was double spiked. During the first part of the track laying the ties were bored on the roadbed by hand, but later they were sized and bored at the treating plant. The tracks are ballasted with 12 in. of crushed stone under the ties. Passing tracks are identical with the main tracks in standards of construction, except that they are ballasted with screenings and a lighter rail is used.

The standard fence is composed of concrete posts spaced 10 ft. apart and five strands of plain wire. Every 200 ft. and at each break in alignment an anchor post supported by two brace posts was placed.

At the eastern junction the interlocking is controlled by an electro-pneumatic machine, with route, locking detector circuits and lever light attachment. The machine has a 47 lever



frame, 19 levers operate 50 signals, 15 levers operate 27 switches, derails and movable point frogs, and there are 13 spare levers. The current for operating the machine is supplied by 32 Edison storage batteries of 200 ampere hour capacity, and the current for the track circuit by 16 Edison storage batteries of 300 ampere hour capacity. The charging current is supplied by a  $3\frac{1}{2}$  k. w. 60 volt, generator operated by a direct connected 6 h. p. gasoline engine, cooled by circulation pumps. A field rheostat reduces the voltage to 20 volts. Air is supplied from the yard air system, but the signal department has an emergency air compressing plant in the tower basement. The signals are carried on one 3-track, one 4-track and two 5-track signal bridges.

At the western junction the interlocking is controlled by a 44-lever, Saxby and Farmer machine. Twenty-three levers operate 23 signals, and 18 levers operate 12 switches, one movable point frog and 14 facing point locks, leaving three spare levers. Two three track signal bridges carry the signals.

At Greenville, a little east of the center of the cut-off, an interlocking plant controls the entrance to the east and west-bound passing sidings and a crossover between the main tracks. The interlocking at this point is controlled by a 24 lever Johnson machine, having four spare levers.

All interlocking towers are of reinforced concrete, with tile roof. Considerable attention was given to the architectural features in designing these towers and a special finish is given the concrete to relieve the monotony of the ordinary smooth surface.

In addition to the interlocking plants at the junctions, with the old line and at Greenville the cut-off is provided with 62 automatic signals spaced about one mile apart. These signals are operated by a wireless circuit and are the Union Switch and Signal Company style "B," home and distant electric semaphore, using two positions in the lower quadrant.

The cut-off has not been in operation a sufficient length of time to provide accurate figures of operating and maintenance costs, but the data at hand would indicate that the preliminary estimate was conservative.

The improvement was designed and constructed under the direction of Lincoln Bush, formerly chief engineer of the D. L. & W., and G. J. Ray, now chief engineer. F. L. Wheaton, engineer of construction, was in immediate charge of the location and construction. The track was constructed by A. J. Naefie, principal assistant engineer, and the interlocking and signal system by M. E. Smith, signal engineer.

## THE TREATMENT OF THE LOCAL MERCHANT.\*

I wish to direct your attention to a feature worthy of careful consideration; one which, in my estimation, is responsible for much of the antagonism towards the railroads. It is in respect to the treatment accorded the country merchants by the railroads of this country. I mean the merchants at the local stations. I was once an agent at such a station; I was once a merchant in such a town, so that I know, by experience, the limitations of the agent to assist the merchant in his struggle to compete with the merchant at the competitive point, and I know the helpless condition of the merchant who must rely upon such an agent for support. Though the agent may be ever so well disposed, his complaints and suggestions must filter through the several departments of the railroads, until they are so thin or so stale when they reach the officials who shape the policy of the road as to merit or receive little attention. These merchants at local towns are deserving of our especial attention and support in their present struggle; not alone because they are neglected by the railroads, but at this particular time because they will have, from the first of January next, a new difficulty confronting them

in sustaining their trade; that is, the establishment of the parcel post, with which I know you are more familiar than I.

The Traffic Bureau of the Business Men's League has given a great deal of attention to this railroad feature of the distribution of goods from this market; and we have been working upon the proposition that the jobber is just as much interested in getting the goods sold by him to his customer in the country, as the retail merchant in this city is in getting the goods to his customer, regardless of this location in St. Louis. Since we have this package car system so perfected that we may intelligently scrutinize the service of all the railroads serving St. Louis, we are contending now for improved service to the local stations.

There is no such thing as a local station to a jobber. The merchant from the smallest local station on any railroad looks just as good to us in this market as though he came from a highly competitive railroad town, and is entitled to our consideration and the consideration of the carriers accordingly.

Through what I consider a mistaken policy of economy in the development of their own properties the railroads of this country have given too much attention to competitive business and too little to local business. The result of this is that, under the present fabric of rates, intermediate towns often pay the same rates as the competitive town beyond, yet shipments leaving here on the same day are often from one to three days longer in reaching the intermediate or local town.

It is gratifying, however, to note that a few progressive managements are taking this view of it also, and are inaugurating methods beneficial to the local points. It rests largely with us, however, to exercise our commercial strength in behalf of our customers by contending forcibly for such a system of distribution of our goods that a more equitable service shall be given to all points. To this end the routing of competitive business should be predicated on the service rendered to local points; or in plainer language, the lines that give especial attention to the systematic and prompt handling of your shipments to local points are entitled to more consideration at the hands of the shippers in the distribution of their competitive business. It is unreasonable to expect, of course, such a revolution in this respect as to have equal service to all points, but the tendency should be in that direction much more than it is at present.

I may be mistaken, but, after giving the subject serious thought, I believe, as a matter of economy to the railroads and the improvement of the service as suggested, smaller cars should be used in this package car trade. Cars so constructed as to carry a maximum load of about the present average merchandise loading, which is approximately 18,000 pounds per car; cars capable of being carried in fast trains, to be switched at local points or small stations without the loss incidental to the handling of cars of large capacity designed especially for carload business, as is the case at present, thus releasing these large cars of 60,000 pounds capacity for the service for which they are designed. The railroads now have cars constructed especially for live stock, for lumber, for coal, for coke, for cooperage and for perishable freight, but none especially designed for the highest class freight they handle; namely, these merchandise, or package car, shipments. By the use of such cars, as suggested, much of the delay incidental to rehandling at break bulk points would be avoided, the expense of operating local or way freight trains greatly reduced, and damage to freight by rehandling eliminated to a great extent. The increased efficiency of their terminal facilities in the loading and unloading of such freight by the use of a smaller and greater number of car units upon the same terminal tracks now used for the large cars, is also an item, I believe, worthy of careful consideration by the railroads.

In short, is it not quite reasonable to expect that the railroads should so classify their service and furnish such facilities as to specialize the less-than-carload merchandise traffic to the extent that all receivers of such freight, both at local as well as competitive points, may rely upon that service as they do upon the express service, and eventually relieve the public of the expensive express service except for the transportation of valuable articles or such as may require the attention of a messenger en route?

\*From an address by P. W. Coyle, Traffic Commissioner of the Business Men's League of St. Louis, before the St. Louis Sales Managers' Association, on November 28, 1912.

# ELECTRIC TRAIN LIGHTING SYSTEMS.

"Light Failures on Well Maintained Electric Service Now  
Average in the Neighborhood of One per One Million Miles."

A paper on Train Lighting, prepared by H. A. Currie, of the New York Central & Hudson River, and Benjamin F. Wood, of the Pennsylvania, was read at the Railroad Session of the American Society of Mechanical Engineers on Thursday, December 5. Following a brief review of the history of candle, oil and gas lighting the various systems of electric lighting, including head-end, storage battery and axle light were considered at length. The following extracts are taken from the section of the paper referring to electric lighting.

**Straight Storage System.**—Each car is provided with a storage battery, which must be charged at terminals during the layover period. A consideration of the requirements for successful operation reveals the following essentials: The capacity of the battery must be in excess of the demand for current to operate lamps, fans, etc., for the longest run between charging periods. The power plant, or other outside source of power, must be of sufficient capacity to meet the maximum demand for charging current. The layover time at terminals must be sufficient to cover all necessary shifting and charging of the batteries at the proper rate. The yard must have a sufficient number of tracks provided

being reduced or steam cut off entirely so that the schedule may be maintained. When the train is broken-up en route, it is obvious that each section must either be equipped with a battery to insure light until the train is again made-up, or provided with some auxiliary light. A member of the train crew must be capable of operating the generating apparatus and of making running repairs and adjustments en route. It is apparent that the use of the head-end system must be restricted to a few trains having assigned runs or that it must be extended to cover all the cars operated by the railroad in electrically-lighted trains.

**Axle Generator System.**—The axle generator systems used in this country comprise the following principal parts: An axle-driven generator mounted on the car truck. A suspension by which the axle generator is supported from the truck frame. A drive, connecting the armature shaft to the axle. A regulator for controlling the voltage and output of the generator at all train speeds. An automatic switch designed to open on reverse current for the purpose of preventing discharge of the battery through the generator. A regulator for controlling the voltage impressed on the lamp circuits. A battery of a suitable number of cells to supply current when generator current is not available.

For the successful operation of the system, the following requirements must be met: The polarity of the generator terminals must remain unchanged with a movement of the car in either direction. At all train speeds from the cutting-in speed of the generator to the maximum, the generator output and voltage must be maintained within the desired working limits. The generator must be automatically connected and disconnected from the battery circuit as the train speed rises above or falls below the critical speed. The lights may be burned at any time and the transfer of this load from the battery to the generator and vice versa must result in no appreciable change in the candle power of the lamps. The voltage impressed on the lamp circuit must be maintained within such limits as will give satisfactory illumination and reasonable life of lamps.

The axle pulley at present in use is of pressed steel, mounted on a steel bushing, the bushing being secured independently to a turned seat on the axle, and the pulley mounted thereon. Belt tension is provided by means of springs which also afford relief to the belt due to the movement of the car axle with respect to the truck frame. One spring is generally used when the generator has top, bottom or sliding suspension and two springs with the parallel link suspension. Chains of the silent type have also been tried and have the advantage of positive action and decrease in bearing pressure, but the wear of the links both on the face and the pivot sprockets has been excessive. Belts of V section have been tried and would seem to have the same advantages as the chains, but it is found that in winter the bottom of the V groove in the sheaves packs with ice and snow, and driving power is lost. Neither the chain nor V belt requires a tension device.

A form of shaft drive, from a bevel gear on the car axle, through an extensible shaft with universal couplings to a generator carried from the car body is being tried. A gear drive, with the generator mounted on the car axle after the manner of the street car motor mounting has also been prepared and will soon be tried. The latter will no doubt require a track pit for the inspection and repair of the generator.

Plain bearings with ring oilers were used almost exclusively until five years ago. With this method of lubrication, it was necessary to carry the oil level so high that it frequently entered the generator frame and damaged the armature and field coils. To overcome this trouble, a form of wick oiler was tried which, however, proved unsatisfactory. The next improvement was a combination ring and chain oiler, which is now in general use

TABLE 1.—COST OF PASSENGER CAR ILLUMINATION BY VARIOUS SYSTEMS.

	1825-1850 Candles	1850-1875 Oil	1875-1900 Gas			1900 Electric		
			Gasolene	Pintach	Acetylene	Head-End	Straight Storage	Axle Coach
Passengers carried.....	4-20	20-50	50-60	60-70	60-70 <sup>1</sup>	30-40	140-50	60-70
Candle Power.....	4-10	20-60	200	300	400	350	250	450
Fixtures and Connections.....	0 to \$3	\$10-\$60	\$500	\$400	\$500	\$700 <sup>2</sup>	\$600	\$1000
<sup>3</sup> Cost of Plant.....	.....	.....	.....	60 <sup>4</sup>	\$40	25	20	.....
<sup>5</sup> Yearly Operating Cost.....	15-25	40-120	150	150	\$200	750	500	200
Yearly Haulage Cost.....	.....	.....	150	200 <sup>6</sup>	\$200	400	300	400
Interest, Insurance and Taxes.....	.....	.....	50	50	\$60	100	62	145
Total Yearly Cost.....	20	60-100	350	400	\$500	1250	1350	750
Cost per Year per Seat.....	1	1.50-2	6	7	\$8	31	34	12

<sup>1</sup> At the time of the prevalence of these systems only limited trains were so equipped.

<sup>2</sup> Including all maintenance.

<sup>3</sup> Share per car considering whole train.

<sup>4</sup> Average

<sup>5</sup> Based on capacity for 500 cars.

Basis for above figures, Passengers Carried suppose all seats to be occupied. The Fixtures and Connections are in nearly every case from actual installations. Cost of Plant is the first cost divided by the capacity in number of cars supplied. Yearly Operating Cost includes fuel or power and attendance and maintenance but not all are actual costs, but are filled out by close estimates. Yearly Cost per Seat is simply an arbitrary means of comparing cost per passenger.

with charging outlets, so arranged that the charging batteries will not interfere with shifting operations.

The ampere-hour meter is coming into general favor as an indicator of the state of charge of the battery. As an adjunct a shunt trip circuit breaker is sometimes installed, the connections being such that, when the battery is fully charged, the pointer on the meter closes a circuit which energizes the shunt trip and opens the breaker, thus cutting the battery off charge.

The operating schedule of cars equipped with this system must be worked out to allow sufficient layover at terminals to permit the charging of batteries and shifting of cars. Anything that restricts the shifting operations necessitates either additional yard trackage, additional motive power, or both. As cars produce a revenue only when in service, it is the aim of the transportation department to decrease the layover period to a minimum.

**Head End System.**—The head-end system consists essentially of a steam-driven generator located in the baggage car or on the locomotive. The successful operation of this system requires that a sufficient amount of steam at the proper pressure be provided when lighting is necessary. As it is the object of the transportation department to get trains to their destination on time, lack of steam is felt first by the lighting system, the pressure



on one type of machine. Waste-packed bearings have also been extensively used and have given no trouble on account of oil entering the generator frame. Considerable trouble, due to hot bearings has been experienced. Ball bearings for axle generators were introduced in England about 1907 and tried in this country in the early part of 1911. Although their use to date has been limited, the indications are that this bearing will become popular on future machines. On account of the widely varying temperatures between summer and winter conditions that obtain in the operation of axle generators, it was necessary to develop special oils that would remain fluid at low temperatures. Those now used have a freezing point of 10 deg. Fahr. For ball bearing lubrication grease should be free from acid or

and 2 5/16 in. in diameter for the smaller sizes. From an engineering standpoint, it is highly desirable that as many of the voltages, wattages and sizes of bulb as is possible be eliminated. From a manufacturing standpoint, it is desirable that some variation be allowed in the voltages, as a large number of high-voltage and low-voltage lamps are accumulated in the manufacture of lamps of a fixed voltage. This brings up the question of the inspection of lamps before purchase.

On account of the method of manufacture of train lighting lamps, manufacturers have found it most convenient to inspect the lamps for initial variation by holding them at a fixed candle power, allowing the voltage and current to vary. From the railroad standpoint, this method of inspection seems to be wrong,

TABLE 2.—ELECTRIC CAR LIGHTING SYSTEMS USED ON AMERICAN RAILROADS.

Railroads	Cars Lighted by Electricity	Cars Lighted by Other Means	Straight Storage		Cars with Turbine		Head-End System		Axle Generator System		Owned and Operated by Railroad Company	Owned and Operated by Pullman Company	Cars Contracted for	Number Cells Lead Battery	Number Cells Nickel-Iron, Alkaline Battery
			No.	Volts	No.	Volts	No.	Volts	No.	Volts					
A. T. & S. F.	682	1120	0	0	0	0	0	0	682	30	632	50	50	11552	25
B. & A.	7	434	0	0	0	0	0	0	0	0	7	0	0	708	0
B. & O.	246	1105	28	60	11	67	64	19	60	143	103	0	3028	100	
Can. Pac.	165	2273	0	0	0	0	0	0	128	24	128	0	37	3072	220
C. St. P. & M.	58	265	0	0	4	0	64	2	60	2	0	0	192	0	
C. & O.	6	258	0	0	0	0	0	6	30	0	0	0	80	50	
C. & A.	103	100	56	32/64	0	0	0	34	32/64	103	0	0	0	0	
C. & E. I.	93	107	2	32	0	0	0	77	32	79	14	0	1264	0	
C. B. & Q.	710	591	0	0	52	cr	52	60	2	30	0	0	5508	0	
C. M. & St. P.	990	308	30	64	58	58	64	9	64	930	60-64	3872	0		
C. G. W.	70	102	0	0	0	0	0	70	30	70	0	0	736	216	
C. & N. W.	672	1000	0	0	23	200	64	17	60	572	100	0	2200	25	
C. R. I. & P.	344	805	0	0	0	0	0	301	30	0	0	36-30	5024	125	
C. C. & C.	46	552	2	0	0	0	0	44	32/64	103	0	0	0	0	
D. L. & W.	44	738	0	0	0	0	0	44	30	0	30	0	704	0	
D. & R. G.	30	348	0	0	0	0	0	29	32	0	0	0	512	0	
E. P. & S. W.	17	46	0	0	0	0	0	17	30	0	0	0	272	0	
Eric.	156	1788	74	30	0	0	0	72	30	146	0	10-30	2448	0	
G. N.	551	402	11	110	45	550	110	1	30	953	0	0	3040	0	
G. R. & I.	33	86	28	60	0	0	0	1	60	33	0	0	912	0	
G. T.	106	0	0	0	0	0	0	15	24	31	75	0	840	0	
F. W. & D. C.	22	31	0	0	0	0	0	22	32	0	0	0	336	25	
Ill. Cen.	330	770	10	30	0	0	0	320	30	240	90	0	2240	3050	
K. C. So.	21	57	0	0	0	0	0	18	30	0	0	0	384	0	
L. V.	219	340	0	0	0	0	0	196	32	0	0	23-30	3480	24	
L. I.	113	404	3	64	0	0	0	109	32	0	0	0	3680	125	
L. S. & M. S.	139	634	0	0	0	0	0	72	30	0	0	0	0	0	
L. & N.	67	558	1	32	0	0	0	59	32	0	0	532	1120	75	
M. P.	208	739	1	32	0	0	0	109	32	0	178	0	1824	0	
M. & O.	6	119	0	0	0	0	0	6	0	0	0	0	0	0	
M. & St. L.	19	76	0	0	0	0	0	19	32	17	2	0	304	0	
M. C.	60	438	0	0	0	0	0	18	60	0	12-30	1248	0		
M. St. P. & S. St. M.	65	328	0	0	0	0	0	65	32	0	20	0	1072	0	
N. Y. C. & H. R.	376	528	0	0	0	0	0	376	32-64	376	0	48	6624	54	
N. Y. C. & St. L.	2	0	0	0	0	0	0	2	60	0	0	0	64	0	
N. Y. N. H. & H.	330	2103	0	0	0	0	3	110	113	30	330	0	36-60	7280	270
N. P.	667	492	0	0	53	658	64	9	64	0	0	0	28621	0	
N. R. of Mex.	36	0	0	0	0	0	0	31	32	9	22	5	592	0	
N. & W.	77	332	0	0	0	0	0	13	30	13	30	64	0	1600	
O. S. L.	84	198	1	32	6	82	64	1	32	282	82	23	480	0	
O. R. & N.	56	55	0	0	7	55	64	1	60	131	0	0	436	0	
Pullman	2400	1864	6	0	0	0	0	2400	30	0	0	0	38400	0	
P. & L. E.	4	134	1	60	0	0	0	2	30	0	0	0	96	0	
P. M.	102	259	0	0	0	0	0	102	32	102	0	0	1632	0	
St. L. & S. F.	246	388	0	0	0	0	0	236	32	0	76	10	3820	0	
St. L. & S. W.	15	208	0	0	0	0	0	4	60	0	11	0	304	0	
So.	258	0	0	0	0	0	0	228	30	0	0	30	4128	0	
S. P.	145	1400	2	0	0	71	64	72	32/64	145	0	0	2200	0	
S. P. L. A. & S. L.	76	97	1	0	0	55	64	20	32/60	24	0	0	608	0	
T. & N. O.	76	533	0	0	0	0	0	16	64	16	47	0	512	0	
T. & B. V.	16	12	0	0	0	0	0	16	32	0	0	0	176	125	
U. P.	221	346	0	0	32eng	202	63	13	64	221	0	44	2020	64	
W. & L. E.	4	72	3	0	0	0	0	1	64	87	0	0	1392	0	
W. P.	86	0	0	0	0	0	0	85	32	0	0	0	0	0	
Penna. East.	1092	2310	845	60	0	0	0	19	60	1226	0	489	53632	2650	
Penna. West.	581	717	526	60	0	0	0	5	30	581	0	54	22592	50	
Vandalia	53	116	42	60	0	0	0	11	60	53	0	0	2128	0	
Wabash	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total, June 30, 1912.	13786	29275	1680	..	307	2069	..	7060	..	7847	1330	1849	242932	8817	
Total, June 30, 1911.	11017	33634	1372	..	192	3185	..	5900	..	..	..	..	202744	..	

alkali; should not oxidize or evaporate; should not gum or lose its body.

**Lamps and Voltage.**—With the introduction of tungsten lamps the standard voltage of axle generators has been changed from 60 to 30 volts Metallized-filament lamps with small opal bulbs, operating at about 2½ watts per c. p. were developed for berth lighting. These lamps gave satisfaction at first, principally because berth lights had never before been furnished. As the public became educated to their use, the demand for more light in berths became pronounced, so that it has been found necessary to use the 15-watt tungsten lamp as a berth lamp, and the use of metallized-filament berth lamps is decreasing very rapidly.

Tungsten lamps for train lighting purposes are now furnished in 10, 15, 20, 25 and 50-watt sizes, although the bulk of demand is concentrated upon 15 and 50-watt lamps. Spherical bulbs are used almost exclusively, 3¾ in. in diameter for the 50-watt lamp

as the voltage of the circuit is maintained at a very closely fixed value in actual service. If the manufacturers could be persuaded to do so, it would be much more desirable to have lamps inspected by holding them at a predetermined voltage, allowing the variations to take place in the wattage and candle power. According to the present method of inspection a variation of 5 per cent. above and below in voltage and 8 per cent. above in watts is allowed. If the demand is concentrated too greatly upon one type of lamp, it will probably be necessary to increase these limits. On the other hand, if the railroads among themselves can standardize their voltage close enough for each voltage class to permit the use of any of the lamps on any railroad, the demand for any one voltage lamp will probably not be great enough to make the increasing of the limits of inspection above mentioned necessary.

Until recently little attention has been given to the develop-

ment of reflectors adapted particularly to railroad service. There are several very efficient ones now on the market which in some cases have increased the intensity of the light on the reading plane in a passenger car as much as 65 per cent. without changing the current consumption or the candle power of the lamps. To secure the best results, attention must be given to the proper location of the filament relative to the reflector.

**Standardization.**—The Association of Railway Electrical Engineers has made recommendations as to the standardization of many of the details pertaining to electric car lighting and a number of the railroads of the country have already indicated their intention of following these recommendations by changing their equipment to conform to the recommended practice. The standard voltages recommended by the Association of Railway Electrical Engineers are: 60 volts (nominal) for straight storage and head-end systems; 30 volts (nominal) for axle generator systems.

The lead battery has been fairly well standardized and the construction recommended includes a two-compartment lead-lined tank with rubber jars. The principal variations from the standard in the lead batteries are that some roads are now using lead covers in place of the rubber covers, this change being made to lessen the danger to battery repairmen on account of gas explosions, and the difference in the method of making the connections to the battery posts. The difference in batteries is not of such a character as to preclude the interchange of batteries on different roads. The nickel-iron battery is manufactured only by one company, and therefore the battery is more easily obtained to standard construction and dimensions.

### PANAMA CANAL TOLLS.\*

By EMORY R. JOHNSON,

Special Commissioner on Panama Traffic and Tolls.

The Panama Canal has been constructed and undoubtedly will be operated primarily to promote the commerce and industry of the United States and the world. The tolls should not only be within what the traffic will bear, but should be low enough to permit commerce to derive substantial benefits from the canal.

The canal should, however, be required to yield such revenues as can be secured without unduly limiting its usefulness. The United States has made a heavy investment, and will have large current operating and maintenance expenses to meet year by year. Business prudence and political wisdom demand that the canal shall be commercially self-supporting, provided revenues large enough to enable the canal to carry itself can be secured without unwisely restricting traffic.

The canal will cost the United States government \$375,000,000, much of which has been, or will be, secured by borrowing funds. The interest and principal of this debt must be paid either from funds secured by general taxes or from the revenues derived from canal tolls. It seems wise and prudent that the United States should adhere to sound business principles in the operation of the canal and in levying tolls. Those who derive immediate benefit from the use of the Panama Canal may properly return to the government a portion of the profit secured from using the canal, provided this policy can be followed out without burdening commerce.

In reaching this conclusion the fact has not been overlooked that the people of the United States will have in the Panama Canal a great military and naval asset. It would be difficult to overestimate the importance to the United States of having strong fortifications and a secure, well-equipped naval base at the sole gateway between the Atlantic and Pacific. The canal, however, will add to our military expenses as well as to our fighting strength. To maintain strong fortifications at the Atlantic and Pacific termini of the canal, manned by at least 6,000 troops, to keep 1,200 marines stationed on the isthmus, to support naval

coaling depots at Cristobal and Balboa, and dry docks and repair shops for the navy at Balboa, and to provide and operate the transports and colliers which the army and navy will need to have to maintain the military establishments on the isthmus will require an annual outlay quite equal to the cost of operating the canal and paying interest on the investment.

The policy of having the annual operation, maintenance, and interest charges borne partly by the military and naval budgets and partly by the revenues derived from tolls has some advocates. Those who hold this view contend that, inasmuch as the canal is a benefit to the navy and to the army as well as to commerce, a part of the canal expenses should be charged against the appropriations made for the support of the army and navy. Two objections may be made to this policy.

1. The canal, as has just been stated, will bring about a large increase in the annual army and navy expenses.

2. The navy is maintained and the canal is fortified not only to enhance our military power but also to protect American commerce on the high seas and to facilitate the extension of our foreign trade.

Commerce will derive large indirect benefits from the addition which the canal will make to our military strength and naval efficiency. The policy of charging tolls upon shipping large enough to produce a revenue equal to the operating, maintenance, and interest expenses will inflict no injustice upon those who use the canal. It will be borne in mind, of course, that the Panama Canal, at least during the early years of its operation, will be used more largely by foreign ships than by American vessels and that the commerce passing through the waterway will, for some years to come, be more largely foreign than American.

The annual revenue ultimately required to make the canal commercially self-supporting will be about \$19,250,000. It is estimated that the operating and maintenance expenses will amount to \$3,500,000 yearly and that \$500,000 will be required for sanitation and for the government of the zone. The interest on \$375,000,000 at 3 per cent. per annum will amount to \$11,250,000, and the treaty with Panama guarantees an annuity, beginning in 1913, of \$250,000 to the Republic of Panama. The sum of these four items is \$15,500,000. If to this there be added 1 per cent. per annum on \$375,000,000 to accumulate a fund to amortize the investment the total annual expenses will be \$19,250,000.

In deciding what tolls shall be charged for the use of the canal, the fundamental question is whether a system of charges can be devised and levied that will ultimately yield about \$19,250,000 per annum without unduly burdening American trade and without seriously limiting the ability of the canal to compete for traffic against the routes via the Straits of Magellan, the Cape of Good Hope, and the Suez Canal.

The investigation of the traffic available for the use of the canal led to the conclusion that about 10,500,000 tons net register of shipping will pass through the canal during the early years of its operation. The rate at which the Suez Canal tonnage and the commerce of the world is increasing indicates that an increase of at least 60 per cent. in the traffic of the Panama Canal may be expected during the decade 1915-1925. It is thus probable that there will be 17,000,000 tons of shipping using the canal during 1925. An increase of 60 per cent. during the second decade of the canal's operation would bring the traffic up to 27,000,000 net register tons at the end of 20 years. These estimates are believed to be conservative. If tolls of \$1.20 per net vessel ton, or charges equal to those which the Suez Canal will impose on and after January 1, 1913, are levied for the first 10 years on all shipping using the Panama Canal, the annual receipts at the end of the first decade will more than cover the estimated operation, maintenance, zone sanitation and government, Panama annuity, and interest charges. It will be possible within 10 years after the opening of the canal to begin the accumulation of an amortization fund.

A toll of \$1.20 per net vessel ton would, in the case of the ordinary cargo steamer, impose a charge of 44 to 80 cents per

\*Abstract from Prof. Johnson's Official Report. An abstract of earlier parts of the report were printed in the issues of August 1 and August 9.



ton upon the freight carried. This is due to the fact that freight vessels can carry from  $1\frac{1}{2}$  to  $2\frac{3}{4}$  tons of cargo for each net register ton. A toll of \$1.20 per net ton would add about 2 to 4 cents per 100 lbs. to the freight rate. Taxes, as well as tolls, are a burden; and it is probable that the canal revenues can be secured with minimum public burden by taking, as canal revenues, a portion of the profits derived by those that directly use the canal.

There has been much discussion of the policy of exempting American ships from the payment of Panama Canal tolls.

It does not come within the province of this report to interpret the scope and meaning of the Hay-Pauncefote treaty. Whatever the Hay-Pauncefote treaty may be held to mean, the policy of the United States as to the exemption of American ships from the payment of Panama tolls should not be decided with reference to the rights of the United States under the treaty. The fundamental questions to be considered are (1) whether the exemption of American shipping from the payment of tolls is required to enable the canal effectively to promote the development of American commerce and shipping, and (2) what effect the non-payment of the tolls by American ships will have on the canal revenues.

The general principle has been enunciated, from time to time, in this report that the rate or rates of toll adopted for the Panama Canal should be such as not unduly to burden American trade; but that the charges should be high enough to secure from the canal revenues that will, within a few years after the opening of the canal, be sufficient to meet the annual operating, maintenance, sanitation, government, annuity, and interest charges, provided revenues of this amount can be secured without limiting the usefulness of the canal in the promotion of American shipping and the development of the commerce of the United States and of the world. The exemption of American shipping from the payment of tolls will reduce the revenues obtained from the canal. Is this sacrifice of revenue necessary and justifiable? The question of special significance is, Will this contribution by the government be effective in building up the American marine?

The arguments in favor of charging all vessels, American and foreign, the same canal tolls and in opposition to the policy of omitting or remitting tolls upon American coastwise shipping may be summarized as follows:

1. It is not necessary to relieve coastwise shipping of canal tolls as long as foreign-built ships are not allowed to engage in the domestic commerce of the United States. American ship-owners have a monopoly of the coastwise trade; the canal will greatly increase the demand for coastwise transportation, and the rates that may be charged by water carriers between our two seaboards will be high enough to make their business profitable. Coastwise shipping will be increased in tonnage in proportion to the enlarged demand for transportation facilities, unless, as is feared by some persons, the steamship lines owned or affiliated with the transcontinental railroads may engage in destructive warfare against vessel lines not connected with the railroads.

If it should be found to be the policy of the railroad-controlled steamship lines—assuming that such lines are permitted to use the canal—to attempt to drive the lines independent of railroad affiliation off the canal route, the independent steamship companies can be protected against unfair competition by Federal supervision and regulation of the services and rates of coastwise carriers. For reasons that are presented below, it is not probable that it will be a wise policy on the part of the railroads to engage in destructive warfare against independent coastwise steamship lines; but, in either event, it will doubtless be wiser for the government to regulate, rather than to limit, the use of the canal.

2. To the argument that Canadian shippers and producers will have an advantage over their competitors in the United States,

because the rates will be lower by foreign vessels than by American ships, two answers are made:

(a) The American producer is protected by the tariff. The principal articles shipped from Washington and Oregon in competition with the producers in British Columbia will be wheat, lumber, and fish. The present tariff upon wheat is 25 cents per bushel and upon flour 25 per cent. ad valorem. Upon lumber the tariff rates range from 50 cents to \$2.75 per thousand feet, and on fish the duties are  $\frac{3}{4}$  cent per pound for most varieties, with a duty of 1 cent per pound upon salmon, mackerel, and halibut.

(b) The rates charged by steamship lines between ports on the Atlantic and ports in British Columbia will probably be the same as the rates of the steamship lines operating between the Atlantic and Pacific seaboards of the United States. The coastwise steamship lines operating through the canal to and from Canadian and British Columbian ports will be in competition with the lines operating between the two seaboards of the United States, and it is not to be expected that the lines serving Canadian and American ports will act independently of each other. In all probability the rates of the several lines, American and foreign, will be fixed in the "conferences" of the interested lines, and it is not to be expected that the rates to and from British Columbian ports will be lower than the rates between the less distant places on the two seaboards of the United States.

Shippers in British Columbia and Canada will be able to charter vessels at lower rates than the shippers in the United States will have to pay, for the reason that American producers and merchants will, unless our navigation laws are changed, be able to secure the services only of American vessels, which, as compared with those under foreign flags, are more expensive to build and to operate. However, as has been explained in earlier parts of this report, a relatively small share of the tonnage between the two seaboards of North America will be shipped as full vessel cargoes. All but a comparatively few of the largest shippers will employ the services of line steamers.

The producers and exporters of lumber from the northwestern states of the United States are desirous of being relieved from the payment of canal tolls in order that they may thereby more readily compete with their Canadian rivals. Lumber is well adapted to shipment as full cargoes in chartered vessels, and the exemption of coastwise shipping from the payment of canal tolls would somewhat increase the profits of the northwestern lumberman. In this connection, however, it should be borne in mind, as has just been stated, that the lumber sent to the eastern ports of the United States has no tariff duties to pay, while the British Columbian shipper to our Atlantic seaboard can enter our markets only by the payment of relatively high duties.

Whether there be tolls on American ships at Panama or not, it is unlikely that much Pacific coast lumber can be sold in the Atlantic markets of the United States in competition with southern lumber. The lumber from the southern mills is shipped north either by cheap all-water routes or by inexpensive rail-and-water routes from Mobile, Jacksonville, Savannah, Charleston, Georgetown, N. C., Norfolk, Va., and numerous other Gulf and south Atlantic ports. The large exports of lumber from Washington and Oregon are shipped mainly to foreign countries, and can be transported in foreign vessels at the same charter rates as are paid by British Columbian exporters.

3. The third argument in favor of relieving American coastwise shipping from Panama tolls—that the tolls charged will be added to railroad rates—assumes an improbable adjustment of rail and water rates. Those who contend that the traffic carried by rail between the eastern and western parts of the United States will be charged rates increased by the rate of canal tolls assume that the rail charges must be and will be controlled by the coast-to-coast water rates and that the schedules of railroad rates will be fixed at such differentials above the water rates as the railroads can charge and secure traffic in competition with the rival

water lines. In order to bring about this adjustment of rail and water rates there must be, first, active, rate-controlling competition among the water lines, and, second, it must be the policy of the railroads to fix rates so as to compete actively with the carriers by water for practically all traffic moving between the two seaboards. Will those conditions exist?

Up to the present time it has been the practice of steamship lines, when operating between common termini, to adjust services and rates by "conference." There is more competition among steamship lines than among railroad companies; but the informal organizations or conferences of steamship companies are able to regulate competition and to prevent rates from being forced by competition to the level below which they could not be forced without making the business unprofitable. When several steamship lines operate over established routes and serve the same sections, they are able by agreements and understandings, with each other so to limit competition as to make their services and rates at least partially monopolistic. Unless prevented by effective government regulation, steamship companies will, like railroad companies, steadily increase the monopolistic character of their service.

If this analysis of the relation of steamship companies with each other be correct, it follows that the rates charged by steamship lines between the two seaboards of the United States will be, or will tend to be, not the lowest rates at which traffic can be profitably handled, but rates as high as the interested steamship lines think the rates can be put without limiting the growth of traffic or without losing tonnage to the railroad lines. Steamship companies, like railroad companies, will tend to charge what the traffic will bear; and steamship traffic will bear such rates as shippers will pay to have their goods transported by water instead of by rail. If this be true, the tendency will be for carriers by water to adjust their charges with reference to the schedules of railroad rates. In so far as this practice of rate making prevails, it will be impossible for the carriers by water to add the canal tolls to their rates. Whether there be canal tolls or not, rates by water carriers will be such as the traffic will bear; the upper limit of what traffic by water will bear will be the lower limit to which rates are brought by the railroads; and the tolls will be paid by the owners of the steamship lines instead of by the shippers in additional water rates.

In the case of chartered vessels, however, the shipper, and not the owner, of the vessels must bear the burden of the canal tolls. Charter rates will necessarily be increased by the amount of the canal tolls; and, in so far as railroads compete with the chartered vessel for lumber and similar traffic, the canal tolls will be of advantage to railroads. This advantage, however, will be more theoretical than real. It is not probable that the railroads can, in any event, compete with the carrier by water for bulk cargoes of lumber, coal, and similar products. The railroads will be obliged to allow that traffic to move by water. They will not run the risk of depressing their general schedule of commodity and class rates for the purpose of preventing chartered vessels from securing traffic that can be handled between the two seaboards of the United States for \$5 per ton.

The probable adjustment of rates, by the coastwise water lines and by the railroads upon traffic between the two seaboards of the United States was considered at length in Chapter IV, and the general conclusion reached was that "it will be the policy of the railroads to allow a portion of the traffic that might be held to the rails to be shipped coastwise through the canal and to maintain rates upon the traffic which can readily be prevented from taking the canal route. It is probable that the railroads will adopt the general policy of surrendering without serious struggle the minor portion of their traffic in order to maintain profitable charges upon the major share of their tonnage."

4. The contention that, unless coastwise shipping is relieved of Panama tolls, there will be an insufficient supply of American ships and that this condition will bring about the admission of foreign-built ships to our domestic trade need not be given great weight. If the canal brings about a large demand for coastwise

transportation facilities it will be profitable for American capital to invest in ships to provide those facilities. If there should prove to be a permanent scarcity of American ships to handle the coast-to-coast traffic, it is probable that the Congress can and will devise methods of aiding American shipping without closing American shipyards to the detriment of our navy.

5. It is earnestly argued by those who favor relieving American shipping of Panama tolls that the policy should be adopted in order to give further aid to the American merchant marine. When subjected to analysis this argument loses force. Our shipping employed in the foreign trade needs assistance, but our coastwise marine has a monopoly of the coastwise trade and does not need further aid. In 1911 there were 3,537,750 tons of American ships enrolled for the domestic trade on the Atlantic-Gulf and Pacific seaboards. The increase during the preceding decade had been 38 per cent. There is thus a relatively large and healthily increasing tonnage of coastwise shipping; and the opening of the Panama Canal will undoubtedly bring about a large addition to the coastwise fleet. Our coastwise marine is now given sufficient aid and protection by our navigation laws.

American shipping engaged in the foreign trade has declined steadily for several decades; and careful consideration may well be given to measures that promise effective aid in building up our shipping registered for the foreign trade; but the exemption of that shipping from the payment of Panama Canal tolls is inadvisable.

The policy is not advisable because the aid given would be of little effect. The amount of money paid by the government to our shipping engaged in the foreign trade would be slight and the subsidy thus granted would be so widely and thinly distributed as to accomplish little, if any, results.

The adoption of the policy of paying back to American shipowners the Panama tolls collected from them, might be a disadvantage instead of an aid to our shipping. The repayment to shipowners of the Panama tolls collected from them would invite similar action by other nations to overcome the effect of our action. It would be a form of subsidy suggesting retaliatory action by foreign governments.

#### RATES OF TOLL—GROSS AND NET REVENUE.

For reasons that have been briefly stated in Chapter IX of this report and which are discussed in detail in the volume upon the Measurement of Vessels, it is recommended that the tolls levied upon merchant vessels for the use of the Panama Canal be based upon net vessel tonnage so determined as to express the ship's earning capacity, and that the tolls upon war vessels be based upon displacement tonnage. It is recommended that the same basis for the levy of tolls—net tonnage or actual earning capacity—be adopted for both freight and passenger vessels, that spaces occupied by passengers and freight pay the same rate of tolls, and that no tolls be levied on passengers.

Tolls on passengers are unjustifiable, because the collection of such charges, in addition to tolls upon the earning capacity of a vessel, or its actual net tonnage—the entire space available for freight and passengers—imposes an unjustifiable double tax upon the portion of the ship devoted to passenger accommodations. The space occupied by passengers ought not to be taxed more heavily than the portion of the ship in which freight is carried.

The following rates of toll upon merchant ships and war vessels are recommended:

On merchant vessels, carrying passengers or cargo, \$1.20 per net vessel ton, or each 100 cu. ft., of actual earning capacity.

On vessels in ballast, without passengers or cargo, 40 per cent. less than the rate of toll upon vessels with passengers or cargo.

Upon all naval vessels other than transports, colliers, hospital ships, and supply ships, 50 cents per displacement ton.

Upon army and navy transports, colliers, hospital ships and supply ships, \$1.20 per net ton, the vessels to be measured by the same rules as are employed in determining the net tonnage of merchant vessels.

The shipping using the Panama Canal may be subdivided into three classes: That engaged in the coastwise commerce between



the two seaboard of the United States, American shipping employed in carrying the foreign commerce of the United States, and foreign shipping carrying the commerce of the United States and foreign countries. The following table states the probable volume of each of these three classes of shipping during the first two years of the operation of the canal, during 1920, and during 1925:

TABLE 1.—CLASSIFICATION OF ESTIMATED NET TONNAGE OF SHIPPING USING THE PANAMA CANAL IN 1915, 1920 AND 1925.

	Average per annum during 1915 and 1916.	1920.	1925.
Coast-to-coast American shipping.....	1,000,000	1,414,000	2,000,000
American shipping carrying foreign commerce of the United States .....	720,000	910,000	1,150,000
Foreign shipping carrying commerce of the United States and foreign countries	8,780,000	11,020,000	13,850,000
Total .....	10,500,000	13,344,000	17,000,000

The figures given in the above table for the tonnage of coast-to-coast American shipping that may be expected to use the Panama Canal during the first year or two of its operation are obtained by estimating that the tonnage of traffic that was available in 1910 will have increased to 1,000,000 net tons by 1915. During 1911 and 1912, the rate of increase has been more rapid than this; but, in order to be on the safe side, this has been the rate of increase assumed. It is believed, however, that the canal will greatly increase the traffic carried by water between the two seaboard of the United States. In constructing the above table, it was estimated that the intercoastal shipping through the canal would double during the decade ending with 1925. At that rate of increase, the coast-to-coast American shipping through the canal will amount to 1,414,000 tons in 1920.

The gross revenue that may be secured from the Panama Canal, with tolls at \$1.20 per net ton upon all merchant vessels, and the estimated share of the total receipts that would be secured from American coastwise shipping, from American vessels engaged in carrying the foreign commerce of the United States, and from foreign shipping are stated in the following table:

TABLE 2.—CLASSIFICATION OF ESTIMATED REVENUE OF THE PANAMA CANAL AT A TOLL OF \$1.20 PER NET TON.

	Average per annum during 1915 and 1916.	1920.	1925.
Coast-to-coast American shipping.....	\$1,200,000	\$1,696,800	\$2,400,000
American shipping carrying foreign commerce of the United States.....	864,000	1,092,000	1,380,000
Foreign shipping carrying commerce of the United States and foreign countries	10,536,000	13,224,000	16,620,000
Total .....	\$12,600,000	\$16,012,800	\$20,400,000

The foregoing table does not take account of the fact that some of the vessels using the Panama Canal will be without cargo or passengers and will pay less than the standard rate of toll. In the investigation of the tonnage of available canal traffic it was found that 96 per cent. of the total shipping that would use the canal consisted of vessels with cargo and 4 per cent. of ships in ballast. This ratio of loaded to ballasted vessels is practically the same as prevails in the traffic of the Suez Canal. If the tolls on 4 per cent. of the total traffic of the Panama Canal are 40 per cent. less than the standard rate of \$1.20 per net ton, the revenue, as stated in the preceding table, should be reduced by 1.6 per cent. This reduction, however, has not been made, partly for the reason that the table does not, and could not, take account of the revenue that may be received from tolls upon war ships.

Table II contains an estimate of the amount of Panama tolls obtainable from American and foreign shipping unless American shipping is exempted from paying tolls. The amount of tolls payable by American ships would, according to the table, rise from somewhat over \$2,000,000 per annum during the first two years of the operation of the canal to about \$3,780,000 during 1925, provided, as is improbable, that the rate of tolls remained \$1.20 per net ton throughout the 10-year period. Should the tolls start and remain at \$1.20 per net ton, foreign shipping will be required to pay about \$10,500,000 in tolls per annum during the first two years of the operation of the canal, and about \$16,200,000 during 1925. A reduction in the rate of tolls before 1925 will cause a proportionate, or nearly equivalent, decrease

in the revenue obtained, both from American and from foreign ships. The exemption of American ships from the payment of tolls, or the repayment of tolls to the owners of American vessels, will mean a sacrifice of one-sixth of the canal revenues during the early years of the operation of the canal and of nearly one-fifth of the revenues at the end of a decade.

If all vessels, American and foreign using the canal are required to pay tolls at the rate of \$1.20 per net ton, the revenues per annum during the first two or three years of the canal's operation will average between twelve and thirteen million dollars. By the end of the first decade the revenues will probably have risen to \$20,000,000. If only foreign ships are required to pay tolls, the receipts during the first few years will be between ten and eleven million dollars per annum and will rise to sixteen or seventeen million dollars by the end of the first 10 years. It is not probable, however, that the rate of \$1.20 per net ton will be maintained throughout the decade. That is the rate that will be charged by the Suez Canal Co. in 1913; and it is more than probable that the Suez Canal Co. will reduce its tolls below that rate within a few years after 1913. It will probably be unwise for the United States to maintain higher tolls at Panama than are charged at Suez.

It will hardly be possible to secure from foreign shipping enough revenues during the first decade of the Panama Canal's operation to meet all operation, depreciation, interest, annuity, zone government, and sanitation charges. On the other hand, if Panama tolls are charged both upon American and upon foreign ships at the rate of tolls that may be expected to prevail at Suez, it will apparently be possible to secure revenues from the Panama Canal that will make it commercially self-supporting during the first decade.

With the growth of traffic through the Panama Canal during the second and succeeding decades of its operation it will be possible, with tolls, at that time, of not exceeding \$1 per net ton, for the United States Government to secure revenues that will permit of the ultimate amortization of the investment in the canal. It will be possible and advisable for the United States, beginning with 1925, to invest 1 per cent. per annum of the \$375,000,000 investment in a sinking fund. If this is done, the annual net revenues must amount to \$19,250,000, or the sum of \$3,500,000 for operation and maintenance, \$500,000 for government and sanitation of the zone, \$11,250,000 for interest, \$250,000 for the Panama annuity, and \$3,750,000 for the sinking fund.

During the second and succeeding decades, moreover, it will unquestionably be necessary to devote relatively large sums per annum to the betterment of the canal to keep the waterway abreast of traffic needs. Will this be possible? An increase of 60 per cent. during the first decade, as has been stated, will bring the canal traffic to 17,000,000 net tons in 1925. Should this rate of increase continue, as it undoubtedly will, during the second decade, the traffic in 1935 will amount to 27,000,000 net tons; and with tolls at that time of \$1 per net ton, revenues of \$27,000,000 per annum may readily be obtained. Receipts of this amount would enable the government to meet all expenses, including operation, maintenance, betterments, zone sanitation and government, the Panama annuity, and the sinking fund.

The figures here given of the probable traffic and possible revenue of the Panama Canal in 1925 and 1935 are estimates based upon a careful study of the rate of increase of the commerce of the United States and foreign countries and of the development of the traffic of the Suez Canal. While it is never safe nor scientific to prophesy, the actual history of commerce during the past 20 years clearly indicates that the estimates regarding the Panama Canal traffic and revenues are conservative. If they shall prove to be so, it will be possible for the United States, without unduly burdening commerce or restricting the usefulness of the canal, to secure enough revenues during the first 20 years to make the canal commercially self-supporting. To follow this policy will be to apply business principles to the management of the Panama Canal, and to prevent its being a continuing burden upon the general treasury and upon the taxpayers of the United States.

## General News.

The shops of the Missouri, Oklahoma & Gulf at Muskogee, Okla., together with two locomotives, were destroyed by fire on the night of November 28.

The bill introduced in the lower House of Congress last spring providing for a physical valuation of railways by the Interstate Commerce Commission was taken up by the House on Tuesday of this week and discussed at some length; but no conclusion was reached. Prominent members thought that the bill would be passed by the House before the end of this week.

The New York *Journal of Commerce*, in its annual summary of the number of stockholders in railroad and industrial corporations, finds that the railroad companies, which had replied up to November 22, have a capital totaling \$2,552,099,202, with 226,525 stockholders. Comparing the same companies in 1911, the total capital was \$2,346,619,002, and the total number of stockholders was 221,079. The average number of shares held by each stockholder was 112.6 in 1912, as against 106.1 in the previous year.

The railroad commission of Louisiana has promulgated a flagging rule and will give a hearing next Tuesday on the proposal to adopt the rule as standard in that state. It is the standard code rule supplemented by seven explanatory paragraphs. It requires the flagman to take a fusee every time he goes out, and to light it at once. He must leave it burning at a point one-quarter mile from the train where he puts down the first torpedo. Where a train is protected by an automatic block signal and the signal is not less than one-half mile back of the train, the flagman need not go back.

H. G. Askew, statistician for the Texas railways, has compiled reports showing that during the fiscal year ending June 30, 1912, a total of 159 trespassers were killed and 232 were injured on 32 roads, representing approximately 90 per cent. of the total railway mileage in the state. This is an increase of 31 trespassers killed and of 58 trespassers injured on the same roads as compared with the fiscal year 1911. He has also made a compilation showing that the 32 roads in the fiscal year ending June 30, 1912, paid out \$2,871,496 for personal injury claims, as compared with \$1,847,701 in the fiscal year 1908. While the payments per mile for 1908 were \$143.54, the average per mile for 1912 was \$206.13.

The Second Minnesota Conservation and Agricultural Development Congress, held recently at Minneapolis, at which there was an attendance of 4,876 registered delegates, the greater part of whom were representative farmers from Minnesota and the other northwestern states, adopted the following resolution regarding railways: "Resolved that the congress appreciates the work of the railways in their active efforts to promote agricultural development in the northwest and recognizes the necessity of new railway construction, believing that such further development of transportation facilities should be encouraged as a means of effective state development, and that the investment of new capital to open up territory not now well served by transportation lines should be hastened by the manifestation of a spirit of friendly co-operation."

The Louisiana railway commission on November 30 issued an order forbidding the Yazoo & Mississippi Valley from putting into effect new train schedules out of New Orleans on December 1, discontinuing a train leaving New Orleans at 2:55 in the afternoon which has been used by the New Orleans afternoon newspapers for the circulation of their papers in Baton Rouge. In place of it the railway has announced a fast night train to Memphis leaving at 11:15 p. m. Following the order of the commission an injunction was issued late Saturday afternoon by Judge Skinner of the state court based on representations by two of the afternoon newspapers that the railway intended to ignore the order of the commission on the ground that the trains were interstate and that the proposed change in service would cause discrimination against them in favor of the morning papers who would be benefited by the 11:15 train. The publishers professed to

see in the change an effort to retaliate for their comments on the recent collision at Montz.

### The Grand Trunk Pacific.

We expect to have the line in operation for through traffic by the beginning of 1915. It is just a question of getting the requisite amount of labor into the territory. At present we have something like 10,000 men at work.

With regard to the criticism that has been directed against the Grand Trunk for not first building between Moncton and Winnipeg in order to link up the eastern system with the western, it is to be said that the construction of that portion of the system is entirely in the hands of the government; the Grand Trunk officers had only the supervision of construction work. This line, in all probability, however, will be completed within the next twenty months. Work on the entire mountain division, from time to time in the past three years, has been held up because of labor shortage and trouble with labor. As late as last August 1,500 men, who were receiving \$3 a day for ordinary labor, struck work and at a time when 2,000 more men were needed. The situation at present is a settled one and the prospect for its remaining so is reassuring. The Dominion government and the provincial governments have a duty to encourage immigration by every means in their power; but a goodly proportion of the laboring population seem to believe that increased immigration will mean decreased wages. If the Grand Trunk had been able to obtain sufficient labor the line would have been completed a year ago; there would be flourishing towns where there are none now, and Prince Rupert would be a busy port with a largely increased population.—*President Chamberlin.*

### Improved Discipline on the B. & O.

The Baltimore & Ohio has established an employment bureau, to deal with employment, discipline and wages throughout the whole system, including the Cincinnati, Hamilton & Dayton, and has put at the head of it Mr. Walber, hitherto assistant general manager. Under this organization the selection of suitable men to fill positions in train and other service will be vested in the employment bureau; this with a view to assuring a high standard and the employment of none but desirable and responsible men. The employment bureau will pass upon applications for positions in train service, and investigate the records of persons desiring to enter the service, with full authority to approve or reject such applications. When applications for employment are made, the bureau will be consulted, and until its sanction has been obtained the service will be but temporary.

Several months ago the Baltimore & Ohio established a labor bureau to employ unskilled workmen, chiefly for maintenance of way. The scope of the labor bureau will be broadened, now that it is to be conducted under executive auspices, and unskilled workmen will be hired in this way for all kinds of service in the operating department. The labor bureau is in no way identified with or operated under contract methods, there being no charges levied against the men; and furthermore, the laborers are transported free to the places where they are to work.

The Baltimore & Ohio announces also that Brown's discipline is to be adopted, and suspensions done away with.

### Conference on Wages.

The conference committee of managers of eastern railways met with the representatives of the firemen in New York City this week, beginning on Tuesday, to take up the request of the firemen for increased pay.

At a meeting before the opening of the conference the managers' committee received the resignation of J. C. Stuart, vice-president of the Erie, as chairman of the committee, and Elisha Lee, assistant to the general manager of the Pennsylvania Railroad, was chosen in his place.

At a meeting in Buffalo last week the 52 representatives of the locomotive engineers, who conducted the engineers' side in the recent arbitration, formed a permanent organization to be known as the Eastern General Chairman's Association of the Brotherhood of Locomotive Engineers. The



52 general chairmen of this committee represent the 52 roads which were parties to the recent arbitration. The new association voted to hold its next meeting in May or June, 1913. The period of one year, for which the arbitration is to be in effect, ends about that time (May 1).

#### The New Haven's Appeal to the Public.

The alarms, well founded or ill-founded, feigned or unfeigned, which filled the newspapers of New York City and New England recently, in connection with reports of three derailments on the New York, New Haven & Hartford have been mentioned in the *Railway Age Gazette*. A peculiarity of this unusual ebullition was the large number of "yellow" falsehoods and exaggerations appearing in some daily newspapers which

## A Test of Railroad Efficiency

**Thirty-two special trains, carrying MORE THAN 50,000 PERSONS to and from the Yale-Harvard football game at New Haven, were moved by the New York, New Haven and Hartford Railroad IN ADDITION to its NORMAL, DENSE TRAFFIC.**

**And these special trains were handled PRACTICALLY ON TIME and WITHOUT MISHAP.**

**For transportation efficiency, this is a RECORD UNRIVALED.**

**It was a test—A SUPREME TEST—of the New Haven's traffic facilities. And the results tell HOW WELL the Railroad RESPONDED.**

**Just consider what a TASK it was.**

**The New Haven's NORMAL BUSINESS constantly places INTENSE PRESSURE on its facilities. Now, on top of an ordinary day's business, think of moving the ENTIRE POPULATION of a city like BROCKTON, HOLYOKE, HAVERHILL or NEW BRITAIN. And moving them SAFELY and ACCORDING TO SCHEDULE.**

**Doesn't this exemplify TRANSPORTATION EFFICIENCY?**

**Doesn't it demonstrate THE NEW HAVEN'S POWER EFFECTIVELY TO PERFORM THE TRANSPORTATION SERVICE OF NEW ENGLAND?**

**The New York, New Haven & Hartford Railroad Co.**

are usually classed as tolerably conservative. Almost in the midst of this journalistic demonstration came the New Haven football game Saturday, November 23, the traffic phases of which event have been noticed in these columns in former years. On Tuesday, the 26th, the papers of the large cities contained the advertisement shown herewith. We have reduced it one-third in width and height.

#### The New Haven and the Grand Trunk.

The grand jury in the federal court at New York City this week took up the investigation of the alleged unlawful doings of the New York, New Haven & Hartford and the Grand Trunk, which was begun two weeks ago at the instance of the attorney-general of the United States, but was suspended. When the inquiry was begun the presidents of both roads offered to give the government access to any of their records, and it is understood that some examination of the records has been made, but extended examination of witnesses seems now to have been decided on. E. H. McHugh, vice-president of the Grand Trunk, was the first witness heard. Timothy E. Byrnes, vice-president of the New Haven road, and A. H. Cochrane, a director of that company, were also called.

Congressman O'Shaunessy, of Rhode Island, has introduced in the House a resolution to provide for the election by the House of a special committee of seven members to inquire into the circumstances surrounding the suspension of work on the Grand Trunk line to Providence. Interviews with Mr. O'Shaunessy seem to indicate that if the department of justice brings out the facts of the situation, his proposition for a committee will not be pushed.

#### Seven Passengers Killed at Dresden, Ohio.

In a rear collision of passenger trains on the Pennsylvania Lines West of Pittsburgh near Dresden, Ohio, on the night of December 3, seven passengers and one brakeman were killed, and two employees and five passengers injured, three of the seven injuries being classed as fatal, these persons having been badly scalded by steam escaping from the locomotive.

Dresden is on the Zanesville division, about two miles south of Trinway, which is the junction with the Pittsburgh division. The account gives no intelligible explanation of the cause of the collision, simply saying that the leading train was stopped because of the failure of the engine and that the flagman went back, but the following train was too close. The rear car of the standing train was completely demolished and the passengers killed and injured were all in this car. The reports would seem to indicate that the block system was not in use.

#### American Society of Civil Engineers.

At the meeting of the American Society of Civil Engineers, held December 4, a paper was presented for discussion, entitled "Tufa Cement, as Manufactured and Used on the Los Angeles Aqueduct," by J. B. Lippincott, M. Am. Soc. C. E. This paper was printed in *Proceedings* for October, 1912.

#### Railway Club of Pittsburgh.

At the next regular meeting of the Railway Club of Pittsburgh, to be held December 19, A. F. Mitchell, superintendent of the heat treating shop of the Carnegie Steel Company, at Homestead, Pa., will read a paper on Heat Treatment of Steel.

#### MEETINGS AND CONVENTIONS.

*The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.*

- AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass. Convention, May 6-9, St. Louis, Mo.
- AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Boston, Mass.
- AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—W. C. Hope, New York.
- AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, East St. Louis, Ill. Annual meeting, June 17-20, Buffalo, N. Y.
- AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, St. Louis, Mo.; 3d Friday of March and September.
- AMERICAN ELECTRIC RAILWAY ASSOCIATION.—H. C. Donecker, 29 W. 39th St., New York.
- AMERICAN ELECTRICAL RAILWAY MANUFACTURERS' ASSOC.—George Keegan, 165 Broadway, New York. Meetings with Am. Elec. Ry. Assoc.
- AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 75 Church St., New York. Next meeting, May 21, New York.
- AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Convention, October 21-23, 1913, Montreal.
- AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Convention, March 18-20, 1913, Chicago.
- AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago. Convention, June 11-13, Atlantic City, N. J.
- AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—A. R. Davis, Central of Georgia, Macon, Ga.
- AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.; annual, June, 1913.
- AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St., New York; 1st and 3d Wed., except June and August, New York.
- AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—J. R. Wemlinger, 13 Park Row, New York; 2d Tuesday of each month, New York.
- AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.
- AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, B. & O., Baltimore, Md. Convention, January 21-23, Chicago.
- ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago. Annual meeting, May 28, Atlantic City, N. J.
- ASSOCIATION OF RAILWAY CLAIM AGENTS.—J. R. McSherry, C. & E. I., Chicago.
- ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago. Semi-annual meeting, June, 1913, Atlantic City, N. J.
- ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 112 West Adams St., Chicago; annual, May 20, 1913, St. Louis, Mo.
- ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Copard, 75 Church St., New York. Meeting Dec. 10-11, 1912, New Orleans, La.
- BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—H. A. Neally, Joseph Dixon Crucible Co., Jersey City, N. J. Meeting with American Railway Bridge and Building Association.
- CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 2d Tuesday in month, except June, July and Aug., Montreal.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursdays, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Thurs. in Jan. and 2d Fri. in March, May, Sept., Nov., Buffalo, N. Y.

CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—L. S. Pomeroy, Old State Capitol building, St. Paul, Minn.; 2d Monday, except June, July, August and September, St. Paul.

ENGINEERS' SOCIETY OF PENNSYLVANIA.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after 2d Saturday, Harrisburg, Pa.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, 803 Fulton building, Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Richmond, Va. Next convention, June 18, Bluff Point, N. Y.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—E. S. Koller, 226 W. Adams St., Chicago; Wed. preceding 3d Thurs., Chicago.

INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, 11, rue de Louvain, Brussels, Belgium. Convention, 1915, Berlin.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—C. G. Hall, 922 McCormick building, Chicago. Annual meeting, May, 1913, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, Chicago & North Western, Escanaba, Mich.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, Lima, Ohio. Annual meeting, August 18, Richmond, Va.

MAINTENANCE OF WAY MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—W. G. Wilson, Lehigh Valley, Easton, Pa.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York. Convention, May 26-29, 1913, Chicago.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago. Convention, June 16-18, Atlantic City, N. J.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOC. OF U. S. AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Annual meeting, September 9-12, Ottawa, Can.

NATIONAL RAILWAY AFFILIATES ASSOC.—Bruce V. Crandall, 537 So. Dearborn St., Chicago. Meetings with Am. Ry. Eng. Assoc.

NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.

NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August, New York.

NORTHERN RAILROAD CLUB.—C. L. Kennedy, C. M. & St. P., Duluth, Minn.; 4th Saturday, Duluth.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—M. W. Rotchford, Union Station, Peoria, Ill.; 2d Tuesday.

RAILROAD CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 2 Rector St., New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Penna. R. R., Pittsburgh, Pa.; 4th Friday in month, except June, July and August, Pittsburgh.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOC.—J. Scribner, 1021 Monadnock Block, Chicago. Meetings with Assoc. Ry. Elec. Engrs.

RAILWAY GARDENING ASSOCIATION.—J. S. Butterfield, Lee's Summit, Mo. Next meeting, August 12-15, Nashville, Tenn.

RAILWAY DEVELOPMENT ASSOCIATION.—W. Nicholson, Kansas City Southern, Kansas City, Mo.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Bethlehem, Pa. Meetings, March 17, Chicago; June 10-11, New York; convention, October 14, Nashville, Tenn.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio. Annual convention, May 19-21, Chicago.

RAILWAY SUPPLY MANUFACTURERS' ASSOC.—J. D. Conway, 2135 Oliver bldg., Pittsburgh, Pa. Meetings with M. M. and M. C. B. Assocs.

RAILWAY TEL. AND TEL. APPLIANCE ASSOC.—W. E. Harkness, 284 Pearl St., New York. Meetings with Assoc. of Ry. Teleg. Sups.

RICHMOND RAILROAD CLUB.—F. O. Robinson, Richmond, Va.; 2d Monday, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—L. C. Ryan, C. & N. W., Sterling, Ill. Convention, September 8-12, 1913, Chicago.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmonds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, La Salle St., Station, Chicago.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala. Next meeting, April 17, Atlanta, Ga.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant bldg., Atlanta, Ga.; 3d Thurs., Jan., March, May, July, Sept., Nov., Atlanta.

TOLEDO TRANSPORTATION CLUB.—J. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday, Toledo.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meeting with Roadmasters' and Maintenance of Way Association.

TRAFFIC CLUB OF CHICAGO.—Guy S. McCabe, La Salle Hotel, Chicago; meetings monthly, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Erie, Pittsburgh, Pa.; meetings monthly, Pittsburgh.

TRAFFIC CLUB OF ST. LOUIS.—A. F. Versen, Mercantile Library building, St. Louis, Mo. Annual meeting in November. Noonday meetings October to May.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7042 Stewart Ave., Chicago. Annual meeting, June 17, Los Angeles, Cal.

TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; first Saturday after first Wednesday.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, L. S. & M. S., Detroit, Mich.; meetings monthly.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y. Annual meeting, August, 1913, Chicago.

UTAH SOCIETY OF ENGINEERS.—R. B. Ketchum, University of Utah, Salt Lake City, Utah; 3d Friday of each month, except July and August.

WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony building, Chicago; 3d Tuesday of each month, except June, July and August.

WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, 1735 Monadnock Block, Chicago; 1st Monday in month, except July and August, Chicago.

## Traffic News.

The Chicago, Peoria & St. Louis announces the establishment of a regular gasoline-electric motor passenger car service between Havana, Ill., and Springfield.

The National Railways of Mexico and the Mexico North Western Railway have been opened to passenger travel after a suspension of business for about six months, because of the repeated revolutionary outbreaks in that country.

Representatives of 5,000 miners in western Kentucky have presented a petition to the governor of the state asking that he take steps to relieve the car shortage which, it is contended, is working a hardship on the miners by depriving them of steady employment.

Exports of merchandise from the United States to Canada in the nine months ending September 30 last, aggregated \$244,000,000, which is about double the value of the exports in the same length of time three years ago. The increase is principally in cotton, corn, lumber, bituminous coal, iron and steel, and automobiles.

The law of South Carolina forbidding the shipment of cotton into that state from a state infested by boll weevil is contrary to the section of the federal constitution vesting in Congress the exclusive power to regulate commerce between the states. This is the decision of a court at Meridian, Miss., reported this week, in which a cotton shipper in Mississippi sued for damages because of the refusal by a firm in South Carolina to accept a shipment of cotton.

The latest remedy proposed for the freight car shortage appears in a bill introduced in Congress by Representative Prouty, of Iowa, last Wednesday; and it is a very drastic one. The main section of the bill directs the railways to require consignees to unload their freight in five days, demurrage or no demurrage. If the railroad does not enforce this rule, it shall be liable in damages to persons who order cars and are unable to get them. The bill contains numerous other provisions, wise and unwise. Mr. Prouty has discovered that in a good many cases consignees find it cheaper to use cars as warehouses, and pay the demurrage, than to put up buildings of their own; and he proposes to put a stop to this intolerable condition.

### An Advertisement.

"Please Ship Your Christmas Packages Early." This familiar injunction appears this year in the papers of New York and other cities in a display advertisement, three columns wide, signed by four prominent express companies, the Adams, United States, American and Wells-Fargo. But the quoted words appear at the bottom; and the main part of the advertisement, illustrated by two pictures, is as follows:

### Express Labels That Protect You.

#### Yellow Label

When you receive an express package bearing a yellow label *pay nothing*. The shipper has already paid the charges.

#### White Label

When you receive an express package bearing a white label *pay the charges*.

#### No Label

If a package bears neither Collect nor Prepaid label it will be delivered without charges, and collection, if proper, will be made thereafter.

### This New System

of yellow and white labels has been adopted by the Express Companies by order of the Interstate Commerce Commission for your benefit and protection. Your co-operation is earnestly requested.

### Car Surpluses and Shortages.

Arthur Hale, chairman of the committee on relations between railroads of the American Railway Association, in presenting statistical bulletin No. 131-A, giving a summary of car surpluses and shortages by groups from August 2, 1911, to November 21, 1912, says: The total surplus on November 21, 1912, was 22,363 cars; on November 7, 1912, 19,897 cars; and on November 22, 1911, 43,059 cars. Compared with the preceding period; there



is an increase in the total surplus of 2,466 cars, made up as follows: 1,910 box, 26 flat, 1,625 miscellaneous and a decrease of 1,095 coal cars. The increase in box car surplus is in groups 2 (New York, New Jersey, Delaware, Maryland and Eastern Pennsylvania), 4 (the Virginias and Carolinas), 6 (Iowa, Illinois, Wisconsin and Minnesota), 7 (Montana, Wyoming, Nebraska and the Dakotas), 9 (Texas, Louisiana and New Mexico), and 11 (Canadian Lines). The increase in flat car surplus is in groups 1 (New England Lines), 6 and 9 (as above). The increase in miscellaneous car surplus is in groups 1 (as above), 3 (Ohio, Indiana, Michigan and Western Pennsylvania), 4, 6 (as above), 10 (Washington, Oregon, Idaho, California, Nevada and Arizona), and 11 (as above). The decrease in coal car surplus is in groups 1, 3, 4, 6, 10 and 11 (as above).

The total shortage on November 21, 1912, was 73,475 cars; on November 7, 1912, 71,156 cars; and on November 22, 1911, 19,949. Compared with the preceding period; there is an increase in the total shortage of 2,319 cars, an increase of 3,361 coal, and 2,784 miscellaneous cars, and a decrease of 3,456 box and 370 flat cars. The decrease in box car shortage is general throughout the country, except in groups 9 and 11 (as above). The decrease in flat car shortage is chiefly in groups 3 (as above), 5 (Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida), 6 (as above), 8 (Kansas, Colorado, Oklahoma, Missouri and Arkansas), 10 and 11 (as above). The increase in coal car shortage is general, except in groups 7 and 8 (as above). The increase in miscellaneous car shortage prevails throughout the country, except in groups 8 and 11 (as above).

Compared with the same date of 1911; there is a decrease in the total surplus of 20,696 cars, of which 5,989 is in box, 2,107 in flat, 6,179 in coal and 6,421 in miscellaneous cars. There is an increase in the total shortage of 53,526 cars of which 30,329 is in

box, 4,311 in flat, 14,092 in coal and 4,794 in miscellaneous cars.

The accompanying table gives car surplus and shortage figures by groups for the last period covered in the report, and totals for the country for corresponding dates in previous years; and the diagram shows total bi-weekly surpluses and shortages from 1907 to 1912.

#### Summary of Revenues and Expenses of Steam Roads in September.

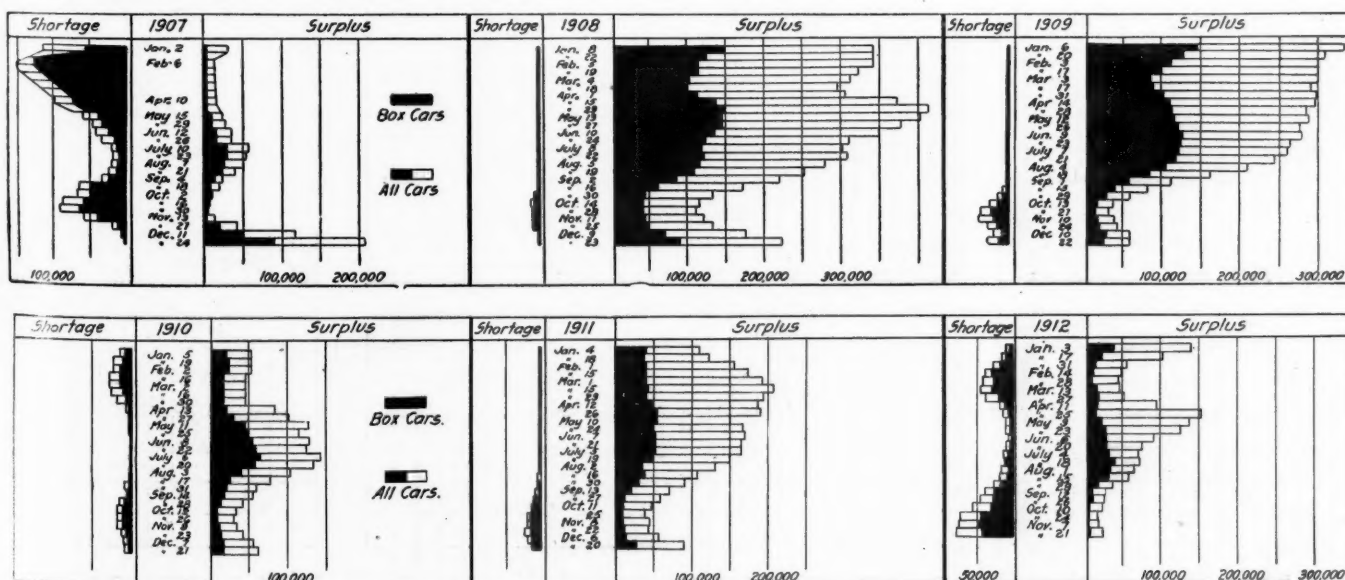
The Bureau of Railway Economics' summary of revenues and expenses and comments thereon for September, 1912, are as follows: The railways whose returns are included in bulletin No. 41 operate 219,851 miles of line, or about ninety per cent. of all the steam railway mileage of the United States. The total operating revenues for the month of September, 1912, amounted to \$266,564,414. This includes revenues from freight and passenger traffic, from carrying mail and express, and from miscellaneous sources. Compared with September, 1911, the total operating revenues of these railways show an increase of \$19,701,553. These total operating revenues per mile of line amounted to \$1,212 in September, 1912, and \$1,138 in September, 1911, an increase for 1912 of \$74, or 6.5 per cent. This increase was the resultant of increases in each revenue account as follows: freight revenue, 8.2 per cent.; passenger revenue, 1.4 per cent.; other transportation revenue, 7.4 per cent.; non-transportation revenue, 12.5 per cent.

Operating expenses, which include all the costs of maintaining track and equipment, operating trains, securing traffic, and of administration, amounted in September to \$171,313,837. This was \$13,804,713 more than for September 1911. These operating expenses per mile of line amounted to \$779 in September, 1912, and

#### CAR SURPLUSES AND SHORTAGES.

Date.	No. of roads.	Surpluses				Shortages			
		Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.	Box.	Flat.	Coal, gondola and hopper.
Group *1.—November 21, 1912.....	7	0	119	0	98	217	1,196	357	858
" 2.—" 21, 1912.....	27	849	33	1,005	163	2,050	3,352	104	3,766
" 3.—" 21, 1912.....	30	0	50	150	26	226	7,626	147	4,408
" 4.—" 21, 1912.....	10	102	18	550	475	1,145	2,803	995	3,255
" 5.—" 21, 1912.....	22	10	0	64	457	531	5,060	1,390	2,364
" 6.—" 21, 1912.....	25	2,317	305	1,440	2,240	6,302	4,235	457	2,053
" 7.—" 21, 1912.....	4	30	26	25	330	411	710	0	110
" 8.—" 21, 1912.....	16	0	113	953	1,116	2,182	4,058	363	545
" 9.—" 21, 1912.....	13	632	160	273	478	1,543	2,026	481	506
" 10.—" 21, 1912.....	22	503	667	1,707	4,459	7,336	4,580	244	307
" 11.—" 21, 1912.....	7	99	86	0	235	420	7,361	256	0
Total, November 21, 1912.....	183	4,542	1,577	6,167	10,077	22,363	43,007	4,794	18,172
" " 22, 1911.....	169	10,531	3,684	12,346	16,498	43,059	12,678	483	4,080
" " 23, 1910.....	152	12,368	3,506	7,249	19,943	43,066	7,305	1,191	4,230
" " 24, 1909.....	163	17,538	4,091	5,628	12,271	39,528	12,230	891	9,542
" " 25, 1908.....	160	45,194	12,157	43,854	31,624	132,829	7,923	178	900

\*Group 1 is composed of New England lines; Group 2—New York, New Jersey, Delaware, Maryland and Eastern Pennsylvania lines; Group 3—Ohio, Indiana, Michigan and Western Pennsylvania lines; Group 4—West Virginia, Virginia, North and South Carolina lines; Group 5—Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida lines; Group 6—Iowa, Illinois, Wisconsin and Minnesota lines; Group 7—Montana, Wyoming, Nebraska, North Dakota and South Dakota lines; Group 8—Kansas, Colorado, Missouri, Arkansas and Oklahoma lines; Group 9—Texas, Louisiana and New Mexico lines; Group 10—Washington, Oregon, Idaho, California and Arizona lines; Group 11—Canadian lines.



Car Surpluses and Shortages from 1907 to 1912.

\$726 in September, 1911, an increase for 1912, of \$53 per mile, or 7.3 per cent. All of the five primary operating expense accounts showed increases in 1912. In the cost per mile of maintaining way and structures, i. e., tracks and buildings, there was an increase of 5.8 per cent.; in the cost per mile of maintaining equipment an increase of 10.9 per cent.; in traffic expenses per mile an increase of 1.4 per cent.; in transportation expenses per mile an increase of 7.0 per cent.; and in general expenses per mile an increase of 1.4 per cent.

Net operating revenue, that is, total operating revenues less operating expenses, amounted in September to \$95,250,577. This was \$5,896,840 more than for September 1911. Net operating revenue per mile of line amounted to \$433 in September, 1912, and \$412 in September, 1911, an increase for 1912 of \$21 per mile, or 5.1 per cent. The net operating revenue for each mile of line for each day in September averaged \$14, and for September, 1911, \$14. It should be recalled that net operating revenue represents gross income before anything has been taken out for taxes, rentals, interest on bonds, appropriations for betterments, or dividends.

Taxes for the month of September amounted to \$10,305,807, or \$47 per mile, an increase of 6.4 per cent. over September, 1911.

The operating ratio for September, that is, the per cent. of total operating revenues which was absorbed in operating expenses, was 64.3 per cent., which is comparable with 64.1 per cent in August, 1912, and 63.8 per cent. in September, 1911.

The eastern group of railways shows an increase in total operating revenue per mile of line as compared with September, 1911, of 6.1 per cent., the southern group an increase of 1.1 per cent., and the western group an increase of 8.7 per cent. Operating expenses per mile increased 7.6 per cent. on the eastern railways, 6.5 per cent. on the southern railways, and 7.2 per cent. on the western railways.

For the eastern group of railways net operating revenue per mile increased 3.4 per cent., and for the western group it increased 11.0 per cent., while for the southern group it decreased 10.0 per cent. The increase in taxes per mile was 7.3 per cent. in the eastern group, 5.8 per cent. in the southern group, and 5.6 per cent. in the western group.

Comparison of the returns for the three months of the fiscal year with those of the corresponding months of the previous fiscal year reveals an increase in total operating revenues per mile of 7.9 per cent., an increase in operating expenses per mile of 7.4 per cent., and an increase in net operating revenue per mile of 8.9 per cent. This net operating revenue per mile of the eastern

group of railways increased 8.0 per cent., as compared with the corresponding period of the fiscal year, that of the western group increased 14.2 per cent., while that of the southern group decreased 5.3 per cent.

When the returns for the nine months of the calendar year 1912 are compared with those of the corresponding months of 1911, they show an increase in total operating revenues per mile of 4.3 per cent., an increase in operating expenses per mile of 5.4 per cent., and an increase in net operating revenue per mile of 1.9 per cent. There was an increase in net operating revenue per mile of 3.1 per cent. in the eastern group, an increase of 4.2 per cent. in the western group, and a decrease of 7.2 per cent. in the southern group.

The diagram shows the variations in total operating revenues, operating expenses, and net operating revenue per mile for the several months of the calendar year 1911, and of the calendar year 1912 to date. The following table shows the per cent. of operating revenues consumed by each class of expenses:

PER CENT. OF TOTAL OPERATING REVENUES.

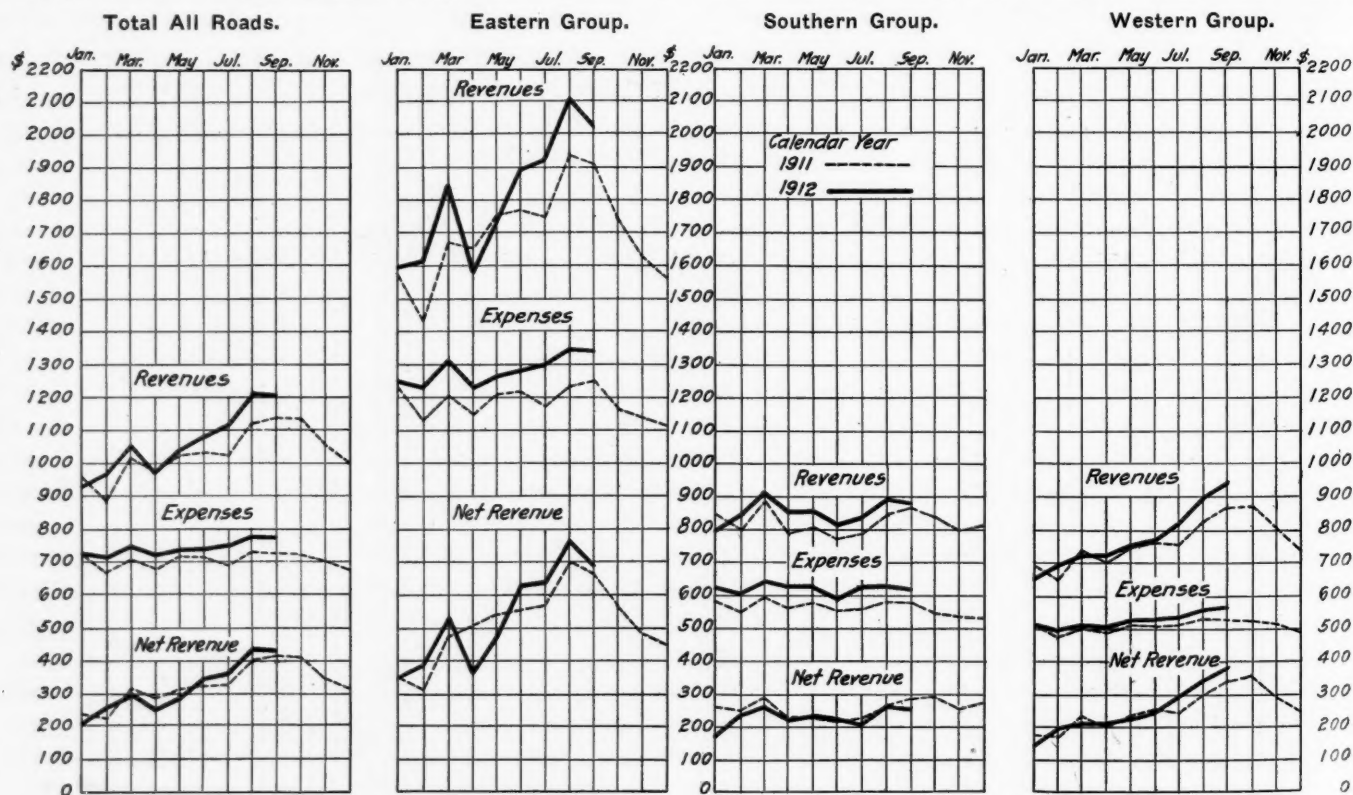
	August,		Fiscal year ended June 30,		Calendar year ended December 31,	
	1912.	1911.	1912.	1911.	1911.	1910.
Maint. of way and structures....	13.1	13.2	12.7	12.9	12.7	13.3
Maint. of equipment.....	15.1	14.5	15.8	15.5	15.5	15.3
Traffic expenses .....	1.9	2.0	2.2	2.2	2.1	2.1
Transportation expenses .....	32.1	31.9	35.9	35.5	35.4	34.7
General expenses .....	2.1	2.2	2.5	2.5	2.6	2.4
Total operating expenses....	64.3	63.8	69.1	68.6	68.3	67.8

#### INTERSTATE COMMERCE COMMISSION.

Commissioner Harlan held a hearing at Dallas, Tex., on November 22 and 23, on a complaint filed by the Chamber of Commerce of Amarillo, Tex., asking for the same freight rate basis as Quanah, Sweetwater, San Angelo and other towns in that district.

Special Examiner Burchmore held a hearing at Chicago on November 25 and November 26, on proposed advances in rates on starch from Cedar Rapids and Boone, Ia., to Missouri river points on traffic destined beyond which had been suspended by the commission.

The commission has further suspended from November 30 until May 30, certain schedules in tariffs of the St. Louis & San Francisco and the Chicago, Rock Island & Pacific, which advance



Monthly Revenues and Expenses Per Mile of Line in 1911 and 1912.



minimum weights on ear corn, in carloads, between St. Louis, Mo., Kansas City, and points in Arkansas, Louisiana, Texas and other states.

The commission has further suspended, from November 29 until May 29, a number of tariffs which advance from 25 cents to 26½ cents per 100 lbs. rates for the transportation of lumber from points in Arkansas, Texas, Louisiana, Mississippi, Alabama, Tennessee and Oklahoma to Omaha and South Omaha, Neb., and Council Bluffs and Des Moines, Iowa.

The commission has suspended until March 31, items in supplements to the Southern Railway tariff, which advance rates for the transportation of furniture from High Point, N. C., and other points in the Carolinas and Virginia to Boston, Mass., New York, Philadelphia, Pa., Baltimore, Md., and other points. The proposed advances vary between 5 and 6 cents per 100 lbs.

The commission has suspended from December 1 until March 31, certain items, which advance from 15½ cents to 19½ cents per 100 lbs. rates on grain from Missouri River points to Gulf ports when for export to European countries. The rates were reduced from 19½ cents to 15½ cents early in August of this year, and it is the restoration to the former figure which is now being suspended by the commission.

The commission has suspended from December 1 until March 31, an item in Hosmer's tariff which eliminates via the Chicago, Rock Island & Pacific and its connections, an existing export rate of 16½ cents per 100 lbs. on oil cake, oil meal, screenings and flaxseed, carloads, from St. Paul and Minneapolis, Minn., to certain Gulf ports, including Galveston, Tex., leaving in effect only the class rate of 35 cents per 100 lbs.

The commission has suspended, until March 31, certain tariffs which advance rates for the transportation of hardwood lumber and articles taking hardwood lumber rates from points in Arkansas, Louisiana and Texas to various Mississippi River crossings, Cairo, Ill., and to points in Kansas, Iowa, Nebraska, etc. In most instances the advance is 2 cents per 100 lbs. In some cases it amounts to as much as 3½ and 4½ cents.

The commission has suspended from December 1 until March 31, the supplement to the tariff of the Minneapolis & St. Louis, which cancels existing joint rates from points on the Minneapolis & St. Louis between Le Beau, S. D., and Marietta, Minn., both inclusive, to Duluth via Minneapolis. The same joint rates, however, would remain in force to Duluth from said points via Hanley Falls, Minn., and the Great Northern Railway. The effect of the commission's suspension is to continue the existing routes via Minneapolis.

#### Complaint Dismissed.

*Eagle Pencil Company v. Nashville, Chattanooga & St. Louis, et al. Opinion by the commission:*

The commission found that the rail-and-water rate of 50 cents per 100 lbs. on cedar pencil material from South Pittsburgh, Tenn., to New York was not unreasonable or unduly discriminatory. (25 I. C. C., 203.)

*Millard T. Riley v. Wabash. Opinion by the commission:*

The complainant seeks reparation at the rate of ¼ cent per bushel for elevation allowance on certain cars of grain elevated by it at Black Rock, N. Y. The commission found that the defendant's tariffs did not provide for such allowance at Black Rock and its refusal to pay the same was not discriminatory or otherwise in violation of the law. (25 I. C. C., 210.)

*Corporation Commission of Oklahoma v. Atchison, Topeka & Santa Fe, et al. Opinion by the commission:*

The complainant seeks the restoration of the sleeping car service formerly maintained by the defendants between Guthrie, Okla., and Canadian, Tex. The commission found that this sleeping car service was only instituted as an experiment, and that it proved unsuccessful financially to the carriers. (25 I. C. C., 120.)

*Hutchinson Mills Company v. Atchison, Topeka & Santa Fe. Opinion by the commission:*

The complainant contends that the tariffs of the defendant provide for the absorption of switching charges at Hutchinson, Kan., on traffic milled in transit at that point, and that the collection of these switching charges by the defendant was unlaw-

ful. The commission found that the tariffs in question did not provide for the absorption of the switching charges at Hutchinson. (25 I. C. C., 180.)

*Theodore Vernheim & Company v. Oregon Railroad & Navigation Company, et al. Opinion by Commissioner Meyer:*

The complainant contends that the rate of \$1.10 per 100 lbs. charged it on a carload shipment of liquid tree spray shipped from Chicago, to Portland, Ore., was unreasonable to the extent that it exceeds 65 cents per 100 lbs., which is the rate applicable to liquid sheep dip. Reparation is asked. The commission found that although the rate complained of was reduced to 85 cents per 100 lbs. within one month after the date of the shipment, this voluntary reduction is not sufficient proof of the unreasonableness of the \$1.10 rate during the period of its effectiveness, and also that under the circumstances existing at the time of the shipment the rate was not excessive. (25 I. C. C., 156.)

*St. Louis Blast Furnace Company v. Virginian Railway et al. Opinion by Commissioner Meyer:*

The allegations set forth in the complaint in this case are substantially the same as in the case of the *St. Louis Blast Furnace Company v. Virginian Railway*, 24 I. C. C., 360 (mentioned in the *Railway Age Gazette* of July 19, page 136), except as regards the matter of reparation. The complainant contends that the rates charged it on shipments of coke from Page, W. Va., and Eagle to St. Louis, Mo., were unreasonable and unjustly discriminatory. Reparation was asked. The commission found that the rates complained of were found just and reasonable in the former case and decided that those findings still hold good. (25 I. C. C., 183.)

*Fels & Company v. Pennsylvania Railroad, et al. Opinion by Commissioner Lane:*

The commission denied the petition of the complainant for a rehearing of this case which was reported in 23 I. C. C., 483, for the purpose of receiving additional proof and also for the purpose of introducing against the Philadelphia, Baltimore & Washington the record in the *Procter & Gamble case*, 9 I. C. C., 440, and for the purpose of again considering an award of reparation against the Philadelphia, Baltimore & Washington under those petitions. The commission found that no reparation could be awarded against the Philadelphia, Baltimore & Washington, because that carrier was not directly or indirectly bound by the order issued in the *Procter & Gamble case*. (25 I. C. C., 154.)

*Humboldt Steamship Company v. White Pass & Yukon Route, consisting of the Pacific & Arctic Railway & Navigation Company, British Columbia Yukon Railway, British Yukon Railway, and British Yukon Navigation Company, Ltd. Opinion by Commissioner Clark:*

In this case the complainant seeks the establishment of through routes and joint rates from Seattle, Wash., to Dawson, Yukon Territory, and to other points in Canadian territory. The commission found that it could not establish such through routes and joint rates, as it has no jurisdiction over railroad and steamship lines located, owned and operated entirely in an adjacent foreign country. The commission also found that the wharf used by the defendants at Skagway, Alaska, is an instrumentality of interstate commerce when used by defendants. (25 I. C. C., 136.)

#### Reparation Awarded.

*Holcker-Elberg Manufacturing Company v. Chicago, Rock Island & Pacific, et al. Opinion by the commission:*

The complainant contends that the rate of \$3.34 per 100 lbs. charged it on a shipment of automobile wind-shield frames from Joliet, Ill., to Dallas, Tex., was unreasonable to the extent that it exceeds the former rate of \$1.67 per 100 lbs. The commission found that the advance was not justified by the defendants, and that therefore the advanced rate is unjust and unreasonable to the extent that it exceeds the former rate of \$1.67 per 100 lbs. (25 I. C. C., 212.)

#### Apple Rates Reduced.

*M. W. Thompson v. Atchison, Topeka & Santa Fe, et al. Opinion by the commission:*

The defendants collected charges for the transportation of apples in carloads from Espanola, N. Mex., to various points

in Arizona and California, in the absence of joint through rates, based on the sum of the intermediate rates which are subject to varying minima. The complainant contends that these charges were excessive and seeks the establishment of a reasonable joint through rate for the future. Reparation is also asked. The commission found that the charges were in each instance unjust and unreasonable to the extent that they exceeded the charges that would have accrued under a joint through rate of 80 cents per 100 lbs. subject to a carload minimum of 30,000 lbs.; and prescribed this rate for the future. Reparation was awarded. (25 I. C. C., 174.)

#### Ohio River Crossings Order Not Modified.

*Manufacturers & Merchants Association of New Albany, Ind., et al. v. Aberdeen & Asheboro Railroad, et al. Opinion by Commissioner Clements:*

The commission denied the application of the complainant for the extension and modification of its order in the original report, 24 I. C. C., 331 (mentioned in the *Railway Age Gazette* of July 26, page 179) and also the application of the defendants to have the original order set aside. The commission found that the part of the complainant's petition asking for a reconsideration of the finding with respect to reparation, however, should have consideration. This branch of the case will be reconsidered and the parties given an opportunity for all arguments thereon. The commission also postpones until December 15, 1912, the effective date of the original order. (25 I. C. C., 116.)

#### Motorcycle Rates Reduced.

*W. A. Griffing, et al. v. Chicago & North Western, et al. Petmecky Company, et al. v. Missouri, Kansas & Texas, et al. Opinion by Commissioner Lane:*

The complainants attack the rate and classification of motorcycles in less than carload lots at  $2\frac{1}{2}$  times the first class rate between specified points in western classification territory as unreasonable. Reparation is asked. The cases were submitted on the decisions in the *Merchants' Traffic Association case*, 13 I. C. C., 283, and in the *Mead Auto Cycle Company case*, unreported opinion No. 435. The defendants ask the commission to consider the testimony taken in *Architects & Engineers Supply Company v. Atchison, Topeka & Santa Fe*, docket No. 4315. The commission found that the rating on motorcycles in less than carloads throughout the western classification territory should be no higher than that on bicycles, which is  $1\frac{1}{2}$  times the current first class rate, and prescribed this rate for the future. Reparation was awarded. (25 I. C. C., 134.)

#### Compartments on the California Limited.

*Edward J. Johnson v. Atchison, Topeka & Santa Fe. Opinion by the commission:*

A passenger traveling on the California Limited from San Diego, Cal., to Boston, Mass., accompanying a corpse, presented a ticket for a compartment, but only one full fare ticket for herself and a full fare ticket for the corpse, and was required by the conductor to purchase an additional half fare ticket in order that she might occupy the compartment. The defendant's passenger tariff provided that a single passenger in order to occupy exclusively a compartment on the California Limited should have a minimum of one and one-half fare tickets. The baggage rule of the defendant required a full first class ticket for the carriage of a corpse in a baggage car in addition to a proper transportation for an attendant. The complainant contends that the ticket for the corpse should have counted on the transportation necessary to entitle the passenger to occupy the compartment. The commission found that one of the tickets presented was in compliance with the baggage rule which left only one full fare ticket for the transportation of the attendant and under the tariff this was not sufficient to entitle the defendant to occupy the compartment. The complaint was dismissed. (25 I. C. C., 207.)

#### Smaller Shipments, Smaller Charges.

*J. W. Wright & Company v. Vandalia Railroad. Opinion by the commission:*

A lathe weighing 3,200 lbs. was shipped from Greenville, Ill., to St. Louis, Mo., and the first class rate of 26.3 cents per 100

lbs. was charged for its transportation. The tariff of the defendant provided that the third class rate of 18.8 cents per 100 lbs. should be charged on machines weighing 4,000 lbs., or more. The charges collected were \$8.42, but had the shipment weighed 4,000 lbs., the charges based on the third class rate would have been \$7.52. The tariff also provided that "a smaller quantity of freight shall not be charged a greater sum than a larger quantity." The defendant contends that this rule applies only as between carload and less than carload shipments, but the commission found that the rule in its present form is unreasonable, in that it does not extend the principle to less than carload shipments when there are two or more rates dependent upon the quantity shipped. The commission decided that the charges collected were unreasonable to the extent that they exceed \$7.52 per 100 lbs. Reparation was awarded. (25 I. C. C., 214.)

#### Grain Elevation Charges Unlawfully Collected.

*P. C. Kamm & Company v. Pennsylvania Company, et al. Opinion by Chairman Prouty:*

The Chicago, Milwaukee & St. Paul collects charges of  $\frac{1}{4}$  cent per bushel for the elevation of grain in its elevator at Milwaukee, both from the grain dealer and from the lines leading east from Milwaukee. The complainant contends that this charge is unreasonable and requests an order which would compel the receiving lines to pay the charge to the complainant rather than to the Chicago, Milwaukee & St. Paul. The commission found that the charge of  $\frac{1}{4}$  cent per bushel was only charged once at the other elevators in Milwaukee, but that it could not compel the receiving lines to pay this elevation charge to the grain dealer, as he had not performed the service of elevation. It decided, however, that when the Chicago, Milwaukee & St. Paul collects this transfer charge of  $\frac{1}{4}$  cent per bushel from the receiving lines no charge shall be made against the grain dealer. Reparation was awarded. (25 I. C. C., 198.)

#### Lumber Shipment Misrouted.

*Beekman Lumber Company v. Louisiana Railway & Navigation Company, et al. Opinion by Commissioner Meyer:*

A carload of lumber was delivered to the Louisiana Railway & Navigation Company at Whitford, La., consigned to the Beekman Lumber Company, Maywood, Ill., with instructions to route via Shreveport and Kansas City. The rate over this route was 23 cents to Kansas City plus 10 cents beyond, amounting to 33 cents per 100 lbs. The initial carrier, contrary to the routing shown in the bill of lading, forwarded the car from Shreveport via Cairo, Ill., and Chicago. The rate to the destination via this route was seven cents less than via the route directed by the consignor. The consignor then filed instructions to have the car reconsign at Kansas City to Oelwein, Ia. Before the car could be located and moved from Maywood to Oelwein, demurrage to the amount of \$13 accrued at Maywood. The complainant contends that had the initial carrier shipped the car as directed, it would have only had to pay the rate of 23 cents per 100 lbs. from Whitford to Kansas City. Reparation is asked. The commission found that the complainant was entitled to reconsign the car at Kansas City and was deprived of this right by the action of the carrier, and also that the shipment was misrouted by the initial carrier. Reparation was awarded. (25 I. C. C., 171.)

#### STATE COMMISSIONS.

Chairman Mayfield, of the Texas Railway Commission, has forwarded to the Interstate Commerce Commission a protest against its recent milling-in-transit order.

The Canadian railway commission has granted the application of the Canadian roads for authority to make an increase in demurrage charges from \$1 to \$2 and \$3 a day; the increase to be effective between December 15 and March 31.

An organization known as the Pacific Coast Public Service Commissioners, comprising members of the Oregon, Washington, California and Nevada commissions, was formed at the recent meeting of the National Association of Railway Commissioners, for the purpose of promoting co-operation between the commissions in work which affects all of the states inter-



ested. C. B. Aitchison, of the Oregon commission, was elected president; George A. Lee, chairman of the Washington commission, vice-president, and E. O. Edgerton, of the California commission, secretary. It was proposed that the members of the association shall meet two or three times a year for conference.

The New York State Public Service Commission, Second district, which has authority over telephone lines throughout the state, has approved the consolidation of the Bell and the independent telephone companies in four counties in the northern part of the state, and has authorized the consolidated company to increase its capital stock from \$150,000 to \$1,000,000, and to issue \$2,000,000 in 5 per cent. mortgage bonds. As a condition of giving this approval, the commission required a statement showing how many subscribers would lose and how many would gain by the proposed rearrangement of rates and by the discontinuance of duplicate telephone accommodations. About 700 duplications will be eliminated, saving \$13,400; but there will be increases in some of the rates so that the net annual saving to subscribers will be \$5,725. The order stipulates that increases in rates shall not hereafter be made except under rigid restrictions. The order is not to be taken as an approval of any rate. Before making any change in existing rates the company must file with the commission its proposed tariffs, which shall not in any respect exceed those heretofore submitted. The tariffs so filed shall remain in force for one year. Provision is also made that upon any complaint filed within six months after any increase in rates the commission shall order a reduction in such rates, and the amount which shall have been collected in excess of the amount allowed by the commission shall be refunded to the subscribers; but such refund may be held awaiting the decision of the courts in case any proceeding to test the validity of the order of the commission is brought within one month after the order shall have become effective.

#### Street Car Fare, Two Cents.

The first reduction of street railroad fare in New York City obtained by virtue of an order from the Public Service Commission for the First District goes into effect this week. It is the local fare over the Williamsburg Bridge across the East River, connecting lower Manhattan with the northern part of Brooklyn. The reduction is from three cents to two cents for a single fare, and from two tickets for five cents to three tickets for five cents for more than a single fare. The company making the reduction is the Bridge Operating Company, owned one-half by the New York Railways Company and one-half by the Brooklyn Rapid Transit Company. The Public Service Commission found that this company was making more than 100 per cent. on its capital stock of \$100,000 from the bridge local traffic, and issued an order reducing the fare as above stated. The company refused to obey the order and appealed to the courts; but the Appellate Division of the Supreme Court in a unanimous decision sustained the Commission, and thereupon the company decided to obey the order.

#### COURT NEWS.

The Supreme Court of Indiana has affirmed the decision of the Marion county court convicting the Pittsburgh, Cincinnati, Chicago & St. Louis of violation of the law of the state requiring locomotives to be equipped with automatic bell-ringers. The court says: "The legislature has the power to protect its citizens in their health and safety. It had the right, and, it must be presumed, exercised it, of learning for itself the reasons which impelled it to act, and unless it can be said, at least, that the act is unreasonable, the courts would not be authorized in overthrowing it. Legislative regulation of the use of private property must be presumed to be reasonable and necessary, unless the contrary appears from facts of which the courts will take notice. Taking into consideration the complexity of modern industrial and commercial life, in which powerful and dangerous railroad locomotives take an important part, it cannot be said that the legislature acted in an unreasonable or arbitrary manner when it enacted a law requiring that locomotives be equipped with a device which will automatically ring the engine bell."

#### REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF SEPTEMBER, 1912.

Name of road.	Average mileage operated during period.	Operating revenues				Operating expenses				Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decr.) comp. with last year.	
		Freight.	Passenger.	Total.	Maintenance— Way and structures.	Of equipment.	Traffic.	Transportation.	General.						Total.
THREE MONTHS OF FISCAL YEAR, 1913.															
Atlantic City	167	\$29,743	\$643,509	\$896,877	\$59,396	\$35,828	\$12,961	\$372,030	\$4,510	\$484,725	\$412,152	\$27,000	\$372,700	—\$23,499	
Georgia	307	456,453	255,540	765,607	97,658	144,329	35,696	389,277	23,902	690,862	74,745	8,888	65,857	—151,792	
International & Great Northern	1,160	2,068,359	714,787	2,944,875	405,088	371,872	75,275	1,066,563	89,297	2,008,095	936,780	90,000	839,433	.....	
Oahu Ry. & Land Co.	101 <sup>1</sup>	254,058	67,647	343,775	24,558	19,784	1,511	65,177	12,650	123,680	220,095	19,500	196,680	33,385	
Philadelphia & Reading	1,016	9,943,003	1,947,134	12,502,248	1,191,880	2,114,066	135,923	3,803,641	178,550	7,424,060	5,078,188	259,609	4,913,680	1,405,796	
Port Reading	21	376,476	.....	387,128	34,096	1,605	93	95,002	558	131,354	255,774	24,000	244,082	120,060	
Texas & Pacific	1,885	2,715,580	1,143,100	4,135,260	786,397	777,467	96,498	1,949,437	135,967	3,745,766	389,494	144,576	230,905	—634,245	
Western Maryland	543	1,504,459	332,522	1,926,863	322,165	255,774	47,278	708,511	36,650	1,370,378	556,485	60,000	496,485	—167,747	

Average mileage operated during previous period—199. — Indicates Deficits, Losses and Decreases.

Average mileage operated during previous period—199. — Indicates Deficits, Losses and Decreases.

## REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF OCTOBER, 1912.

Name of road.	Average mileage operated during period.	Operating revenues				Operating expenses				Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decrease) comp. with last year.
		Freight.	Passenger.	Total.	Maintenance of way and structures, equipment.	Traffic.	Portation.	General.	Total.					
Alabama & Vicksburg.....	143	\$113,408	\$47,644	\$161,052	\$27,793	\$3,692	\$49,599	\$5,468	\$112,502	\$60,524	—\$97	\$5,975	\$54,452	\$11,995
Alabama Great Southern.....	309	106,361	106,361	212,722	56,531	12,166	120,423	10,149	120,423	164,592	—246	14,415	149,931	33,359
Atchison, Topeka & Santa Fe.....	8,202	6,551,074	2,120,629	8,671,703	1,540,040	173,481	2,377,939	158,511	6,018,065	3,333,884	.....	342,570	2,991,314	283,461
Atlanta, Birmingham & Atlantic.....	662	240,855	54,720	295,575	43,497	15,510	110,937	11,851	225,425	88,422	.....	13,150	75,272	—10,802
Atlantic & St. Lawrence.....	167	105,765	30,724	136,489	50,733	3,138	74,400	2,941	148,430	—3,298	.....	7,314	—10,612	—8,061
Atlantic Coast Line.....	4,609	2,126,195	677,506	2,803,701	413,817	53,439	1,029,657	77,393	2,038,266	995,191	.....	125,000	870,191	—8,280
Bangor & Aroostook.....	631	234,181	67,148	301,329	55,105	3,715	84,125	10,626	185,180	130,279	.....	10,500	119,779	7,409
Bessemer & Lake Erie.....	204	925,286	25,519	950,805	82,816	8,263	200,804	10,044	424,909	536,533	.....	9,000	527,533	51,064
Buffalo, Rochester & Pittsburgh.....	570	919,515	88,209	1,007,724	184,664	11,321	314,417	18,495	733,737	319,866	—248	17,000	302,618	43,907
Canadian Pacific Lines in Maine.....	233	50,090	18,864	68,954	25,170	5,715	31,475	5,104	81,379	—5,205	.....	10,000	—15,205	—10,923
Central of New Jersey.....	669	2,065,893	458,892	2,524,785	201,993	34,026	727,841	38,365	1,354,883	1,309,999	—16,749	64,741	1,227,609	202,274
Central New England.....	277	248,319	39,621	287,940	64,354	1,226	81,900	6,755	179,090	150,601	191	10,000	140,792	—13,024
Charleston & Western Carolina.....	341	151,017	30,093	181,110	29,905	3,542	63,393	5,419	139,074	51,676	.....	5,000	46,676	—23,621
Chicago & Eastern Illinois.....	1,275	1,113,299	256,881	1,370,180	185,920	26,006	2,941,299	46,296	1,065,010	415,529	—1,734	45,000	368,795	—65,542
Chicago & Northwestern.....	7,970	5,754,927	1,802,866	7,557,793	1,067,441	117,986	2,941,299	128,525	5,288,120	2,968,481	2,946	303,000	2,668,427	381,337
Chicago Great Western.....	1,496	965,917	278,922	1,244,839	177,495	44,965	482,994	33,798	912,291	429,685	1,225	35,090	395,820	22,945
Chicago, Rock Island & Pacific.....	7,567	4,681,380	1,715,067	6,396,447	980,606	137,074	2,424,631	137,909	4,570,124	2,199,478	—14,162	246,592	1,938,724	237,935
Chicago, St. Paul, Minneapolis & Omaha.....	1,744	1,236,081	440,409	1,676,490	247,764	27,275	607,198	31,117	1,101,257	681,765	240	74,087	607,918	69,142
Cincinnati, Hamilton & Dayton.....	1,015	727,310	156,886	884,196	110,456	160,069	374,368	18,619	681,874	304,562	.....	39,296	266,266	19,227
Cincinnati, New Orleans & Texas Pacific.....	337	674,050	166,208	840,258	93,216	22,204	237,114	21,378	579,701	304,876	.....	29,800	275,144	21,817
Colorado Midland.....	338	181,012	22,915	203,927	21,465	7,101	88,575	5,566	159,187	61,299	—550	10,000	50,749	7,630
Cumberland Valley.....	162	239,774	66,167	305,941	51,537	4,509	95,249	7,326	194,955	125,330	256	5,611	119,875	31,801
Delaware, Lackawanna & Western.....	959	2,910,221	708,561	3,618,782	421,259	73,180	1,156,051	62,326	2,262,488	1,598,337	83,866	125,760	1,556,443	372,121
Detroit & Mackinac.....	411	74,928	27,801	102,729	14,393	2,151	38,109	3,101	76,169	37,236	38	8,595	27,169	8,699
Grand Rapids & Indiana.....	586	298,321	141,160	439,481	57,213	10,944	198,084	16,216	355,939	127,665	—1,033	22,690	103,942	1,394
Grand Trunk Western.....	347	421,000	186,000	607,000	64,024	18,214	276,957	14,258	453,262	192,758	—5,254	29,877	157,627	35,386
Kansas City Southern.....	827	719,024	144,993	864,017	121,309	27,113	291,141	19,343	563,368	390,619	.....	35,842	354,777	65,996
Long Island.....	399	359,093	551,658	910,751	144,337	12,303	420,563	19,943	709,986	248,414	61,508	56,540	253,472	103,572
Louisville & Nashville.....	4,723	3,991,696	1,069,853	5,061,549	842,739	106,736	1,636,059	120,759	3,758,207	1,632,746	—7,017	153,242	1,472,487	—317,568
Maine Central.....	1,204	674,294	296,891	971,185	187,659	8,471	348,210	24,396	706,728	325,304	486	42,877	282,913	31,134
Midland Valley.....	373	116,711	45,100	161,811	33,867	2,490	47,344	6,036	111,454	57,490	713	5,468	52,735	—4,127
Mobile & Ohio.....	1,114	933,195	131,649	1,064,844	124,703	40,020	369,037	30,909	767,967	359,539	—1,608	29,859	328,072	—48,020
Monongahela.....	65	143,224	2,486	145,710	14,560	349	26,471	2,006	51,704	95,796	.....	2,000	93,796	43,635
New Orleans & North Eastern.....	196	241,922	55,553	297,475	34,517	9,647	112,862	11,939	226,206	94,696	341	12,400	82,637	—28,464
New York, Chicago & St. Louis.....	565	1,066,160	142,966	1,209,126	122,873	50,856	463,537	20,040	791,574	461,440	—2,098	36,000	423,342	152,784
New York, New Haven & Hartford.....	2,091	3,193,487	2,498,277	5,691,764	643,258	29,571	2,287,220	148,657	3,897,348	2,416,680	151,764	335,000	2,233,444	394,330
New York, Philadelphia & Norfolk.....	112	238,265	37,830	276,095	26,096	3,377	129,074	12,434	227,884	71,140	.....	7,900	63,240	—12,683
Norfolk & Western.....	473	935,842	214,861	1,150,703	153,022	15,858	578,838	24,328	986,966	236,951	1,598	39,096	199,453	25,033
Northern Pacific.....	6,233	5,846,297	1,409,942	7,256,239	952,778	102,832	2,167,562	87,257	4,028,602	3,638,441	34,307	329,334	3,343,414	461,942
Pennsylvania Co.....	1,751	4,730,970	824,165	5,555,135	790,142	83,311	1,987,241	93,333	3,981,429	2,153,364	—3,500	247,375	1,902,489	428,057
Pennsylvania Railroad.....	4,021	12,164,686	3,176,061	15,340,747	1,998,916	196,284	5,577,479	326,794	11,416,480	6,958,135	—36,330	593,969	4,327,836	331,502
Pere Marquette.....	2,330	1,164,849	326,635	1,491,484	252,239	34,729	626,757	34,729	1,173,051	452,485	13,207	56,952	408,740	28,481
Philadelphia, Baltimore & Washington.....	713	954,844	706,007	1,660,851	295,055	28,771	730,722	39,850	1,380,222	451,772	.....	39,096	394,100	—35,869
Pittsburgh, Cincinnati, Chic. & St. Louis.....	1,467	3,057,798	695,036	3,752,834	654,886	71,873	1,396,304	69,740	2,912,340	1,269,557	—749	142,186	1,126,622	181,575
Richmond, Fredericksburg & Potomac.....	1,880	107,651	78,134	185,785	24,955	2,922	85,662	7,668	146,907	65,074	.....	247,375	64,360	—8,456
Rutland.....	468	197,625	113,147	310,772	41,112	8,071	128,885	6,406	245,239	106,677	.....	12,792	93,885	4,293
San Antonio & Aransas Pass.....	727	417,766	129,981	547,747	74,891	5,672	177,245	10,669	322,342	251,304	.....	12,000	239,304	68,864
Southern.....	7,034	4,337,537	1,520,481	5,858,018	754,650	162,990	1,993,417	162,561	4,098,808	2,239,387	8,013	202,297	2,045,103	112,638
Southern in Mississippi.....	281	86,874	.....	86,874	26,301	2,727	44,332	4,114	87,637	39,417	.....	6,761	32,656	—5,206
Syracuse, Binghamton & New York.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tennessee Central.....	294	107,329	37,492	144,821	30,077	6,235	51,767	7,881	110,147	42,537	.....	4,265	38,272	8,250
Union R. R. of Baltimore.....	9	121,040	22,837	143,877	9,764	870	5,067	2,615	18,316	127,160	.....	5,245	10,227	10,227
Union R. R. of Pennsylvania.....	31	.....	.....	.....	33,969	100	147,408	2,768	272,921	131,770	.....	7,000	189,094	—11,244
Vandalia.....	827	765,810	220,090	985,900	126,420	24,168	361,692	18,962	715,580	367,574	.....	29,624	337,950	119,185
Vicksburg, Shreveport & Pacific.....	171	94,501	45,607	140,108	25,563	3,441	44,384	5,536	104,552	46,623	—51	6,300	40,272	9,928

† Revenues and Expenses of the Syracuse, Binghamton &amp; New York Railroad for October, 1912, included.

‡ Operations of this road were taken over by the Delaware, Lackawanna &amp; Western Railroad Co. on October 1, 1912.

Average mileage operated during previous period—17,613; 24,502; 3,628; 4,573; 6,672; 7,551; 8,930; 9,358; 10,587; 11,470; 12,165; 13,368; 14,562; 15,472; 16,601; 17,141; 18,398; 19,831; 20,883; 21,709.

— Indicates Deficits, Losses and Decreases.



## REVENUES AND EXPENSES OF RAILWAYS.

FOUR MONTHS OF FISCAL YEAR, 1913.

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decr.) comp. with last year.
		Freight.	Passenger.	Total.	Way and structures.	Maintenance of equipment.	Traffic.	Trans.				
Alabama & Vicksburg	143	\$397,520	\$174,344	\$571,864	\$87,327	\$100,120	\$14,399	\$209,294	\$20,758	\$23,900	\$155,574	\$38,150
Alabama Great Southern	309	1,103,559	448,370	1,551,929	202,553	322,843	50,132	522,568	37,141	56,980	1,264,808	122,557
Atlanta, Tampa & Santa Fe	8,202 <sup>1</sup>	227,471	8,483,814	8,711,285	5,647,566	5,672,869	648,138	9,202,568	63,557	1,344,588	10,259,015	1,345,935
Atlanta, Birmingham & Atlantic	662	763,569	227,313	990,882	1,880,825	1,672,689	68,488	1,672,689	15,526	53,550	1,464,613	129,928
Atlantic & St. Lawrence	167	319,319	135,468	454,787	174,939	73,635	15,593	226,077	11,815	22,255	39,047	1,103
Atlantic Coast Line	4,609 <sup>2</sup>	6,929,896	2,707,131	9,637,027	1,596,621	1,817,622	187,663	3,872,906	299,199	500,000	2,120,839	376,274
Baltimore & Annapolis	631 <sup>3</sup>	718,604	255,600	974,204	1,040,633	1,177,717	15,706	308,377	37,930	42,000	309,934	38,831
Baltimore & Lake Erie	204	3,700,111	1,887,721	5,587,832	332,347	332,347	38,005	831,551	37,389	36,000	2,088,831	38,831
Buffalo, Rochester & Pittsburgh	570 <sup>4</sup>	3,323,150	438,524	3,761,674	3,920,425	733,724	47,398	1,165,576	73,400	68,000	1,174,183	131,278
Canadian Pacific Lines in Maine	233	174,636	83,270	257,906	289,572	45,936	22,589	127,873	18,159	40,000	1,061,196	36,032
Central of New Jersey	669 <sup>5</sup>	7,593,442	2,174,409	9,767,851	866,959	1,382,783	133,181	2,877,441	164,389	542,723	4,440,332	628,998
Central New England	277	1,118,948	131,432	1,250,380	1,305,629	1,951,701	15,281	331,578	35,172	40,000	626,430	158,489
Charlotte & Western Carolina	341	430,819	128,977	559,796	1,188,000	108,760	13,854	227,372	18,703	20,000	83,422	105,347
Chicago & Eastern Illinois	1,275	4,077,161	1,105,092	5,182,253	758,388	1,114,197	96,991	1,987,709	174,913	161,000	1,311,117	279,246
Chicago & North Western	7,970 <sup>6</sup>	19,488,249	7,843,466	27,331,715	29,931,971	4,000,883	465,250	10,757,093	505,895	1,212,000	8,916,431	939,420
Chicago Great Western	1,496	3,347,278	1,196,231	4,543,509	617,832	663,776	188,442	1,810,265	134,428	140,452	1,357,228	117,514
Chicago, Rock Island & Pacific	7,566 <sup>7</sup>	16,095,940	7,173,026	23,268,966	3,735,710	3,304,030	624,593	8,973,182	555,681	940,199	6,501,866	1,238,678
Chicago, St. Paul, Minneapolis & Omaha	1,744	3,894,662	1,882,339	5,777,001	945,374	751,281	112,158	2,238,940	129,526	282,686	1,716,337	238,652
Cincinnati, Hamilton & Dayton	1,015	2,749,311	640,013	3,389,324	421,105	624,915	81,003	1,406,830	73,238	138,334	1,027,557	29,832
Cincinnati, New Orleans & Texas Pacific	337	2,532,144	631,422	3,163,566	343,306	753,019	91,009	917,996	76,034	111,200	1,040,406	125,875
Colorado Midland	338	602,991	128,887	731,878	105,594	142,783	29,790	334,227	21,866	33,600	115,450	25,216
Cumberland Valley	92 <sup>8</sup>	860,165	269,502	1,129,667	208,206	131,021	18,456	350,385	30,223	22,446	423,623	91,228
Delaware, Lackawanna & Western	159 <sup>9</sup>	1,253,262	2,982,433	4,235,695	1,880,061	2,046,300	269,158	4,035,174	249,720	632,580	5,228,947	689,420
Detroit & Mackinac	411 <sup>10</sup>	276,831	131,854	408,685	373,789	52,726	9,102	73,789	11,719	34,643	107,541	10,966
Grand Rapids & Indiana	586 <sup>11</sup>	1,089,173	775,622	1,864,795	238,168	279,624	45,552	793,032	61,443	90,766	517,590	5,785
Grand Trunk Western	347	1,449,000	827,000	2,276,000	314,623	326,914	80,436	964,907	55,284	119,509	559,281	6,104
Kansas City Southern	827	2,670,614	602,448	3,273,062	3,634,434	4,917,066	102,754	1,126,265	123,784	133,368	1,294,794	320,889
Long Island	399	1,258,655	3,152,540	4,411,195	505,625	449,673	68,782	1,725,286	85,102	225,800	1,860,045	180,898
Louisville & Nashville	4,723 <sup>12</sup>	14,005,632	4,515,154	18,520,786	3,169,848	3,823,523	409,629	6,248,086	417,512	612,967	5,026,799	572,213
Maine Central	1,204 <sup>13</sup>	2,344,704	1,515,757	3,860,461	761,285	513,021	51,138	1,399,049	94,875	171,568	1,124,033	65,671
Midland Valley	373 <sup>14</sup>	356,452	166,835	523,287	134,580	82,151	10,427	167,572	21,752	21,871	113,795	22,291
Mobile & Ohio	1,114	3,301,129	530,174	3,831,303	481,759	756,211	149,470	1,415,504	119,990	119,436	1,004,824	737
Monongahela	65	516,659	9,700	526,359	76,490	40,649	1,335	99,733	7,910	8,000	298,509	105,422
New Orleans & North Eastern	196	895,667	219,738	1,115,405	132,945	232,336	39,976	473,323	45,265	49,600	231,150	85,283
New York, Chicago & St. Louis	565 <sup>15</sup>	3,470,473	608,796	4,079,269	4,235,708	504,507	194,659	1,675,090	66,300	144,000	1,105,074	55,970
New York, New Haven & Hartford	2,091	11,918,163	10,335,898	22,254,061	2,612,135	2,781,642	130,705	8,459,618	550,725	1,341,000	9,149,718	1,583,333
New York, Philadelphia & Norfolk	112	1,003,761	191,088	1,194,849	1,295,019	1,610,110	16,130	530,382	50,184	31,600	344,353	20,089
Norfolk Southern	473 <sup>16</sup>	3,376,906	901,078	4,277,984	586,227	808,519	65,072	2,066,683	99,792	155,195	784,182	190,701
Northern Pacific	6,233 <sup>17</sup>	18,572,685	6,089,141	24,661,826	3,877,625	2,881,812	416,222	7,555,695	336,048	1,247,333	9,895,403	799,553
Pennsylvania Co.	1,751 <sup>18</sup>	18,290,005	3,612,408	21,902,413	3,262,289	3,998,080	332,022	7,566,748	378,348	938,982	7,674,410	1,485,862
Pennsylvania Railroad	4,021 <sup>19</sup>	44,836,726	13,316,940	58,153,666	7,806,019	12,302,642	769,428	20,803,547	1,353,993	2,423,038	16,458,142	2,333,365
Pere Marquette	2,330 <sup>20</sup>	3,911,181	1,690,968	5,602,149	832,106	960,180	140,909	2,381,244	148,477	228,151	1,470,069	11,781
Philadelphia, Baltimore & Washington	713	3,783,171	2,887,278	6,670,449	1,181,691	1,210,036	108,043	2,863,913	172,725	214,202	1,598,472	133,477
Pittsburgh, Cincinnati, Chic. & St. Louis	1,467	11,061,709	3,000,770	14,062,479	2,318,284	2,764,114	288,496	5,193,971	277,572	567,331	4,187,638	460,979
Richmond, Fredericksburg & Potomac	1,88 <sup>21</sup>	462,425	300,770	763,195	107,457	109,644	11,668	313,572	25,651	2,856	300,220	40,960
Rutland	468	714,171	497,386	1,211,557	153,295	252,987	34,988	507,479	24,764	53,852	354,646	11,160
San Antonio & Aransas Pass	727	1,421,541	534,836	1,956,377	273,901	211,968	24,147	641,862	41,376	48,000	799,971	159,103
Southern	7,034 <sup>22</sup>	14,695,484	6,555,484	21,250,968	2,920,354	3,814,832	656,709	7,438,138	633,414	809,413	6,720,288	260,269
Southern in Mississippi	281	217,442	116,503	333,945	114,553	32,366	10,000	151,356	15,575	27,047	131,174	51,659
Syracuse, Binghamton & New York	294	374,293	162,337	536,630	122,152	57,070	23,917	183,391	28,586	17,058	135,414	9,119
Tennessee Central	9	461,783	94,319	556,102	562,326	40,731	3,056	20,811	10,541	20,979	466,568	46,679
Union R. R. of Pennsylvania	31	2,705,822	874,601	3,580,423	1,883,483	120,720	504	581,436	12,010	1,057,881	811,039	45,540
Vandalia	827	335,509	176,685	512,194	3,965,932	686,097	102,337	1,350,752	73,371	118,199	1,094,804	383,805
Vicksburg, Shreveport & Pacific	171	335,509	176,685	512,194	123,470	97,689	12,851	165,474	19,974	25,200	108,741	24,525

† Revenues and Expenses of the Syracuse, Binghamton &amp; New York Railroad for October, 1912, included.

‡ Operations of this road were taken over by the Delaware, Lackawanna &amp; Western Railroad Co. on October 1, 1912.

Average mileage operated during previous period—<sup>1</sup> 7,613; <sup>2</sup> 4,502; <sup>3</sup> 4,705; <sup>4</sup> 5,621; <sup>5</sup> 6,016; <sup>6</sup> 1,416; <sup>7</sup> 3,978; <sup>8</sup> 2,331; <sup>9</sup> 83; <sup>10</sup> 7,089.

— Indicates Deficits, Losses and Decreases.

## Railway Officers.

### Executive, Financial and Legal Officers.

Duane E. Minard has been appointed an assistant general solicitor of the Erie, with office at New York.

Roy F. Britton has resigned as assistant general attorney of the St. Louis Southwestern, to enter the private practice of law as a member of the firm of Collins, Barker & Britton, St. Louis, Mo.

W. S. Becker, general superintendent of the Western general division of the Norfolk & Western at Bluefield, W. Va., has been appointed assistant to the vice-president in charge of operation, and will be assigned to special duties, with office at Bluefield.

Stanford H. E. Freund has been appointed general attorney of the Great Northern, with headquarters at St. Paul, Minn., to succeed J. D. Armstrong, resigned. John F. Finerty, Jr., has been appointed assistant general attorney, with headquarters at St. Paul.

Alfred E. Rosevear, whose appointment as assistant to vice-president of the Grand Trunk, with headquarters at Montreal, Que., has been announced in these columns, was born on February 20, 1863, at Montreal, and was educated at Montreal Academy. He began railway work on May 1, 1879, as a clerk in the motive power department of the Grand Trunk. The following year he was made clerk in the general superintendent's office, and from 1885 to 1890 was stenographer in the general manager's office. From 1890 to 1892 he was with the West Shore Fast Freight Line at Chicago and at Detroit, Mich., and then for six years was in the accounting department of the Reading Despatch at Detroit, becoming acting manager of the same line in September, 1898. He was appointed freight claim agent of the Grand Trunk in October, 1898, and in April, 1908, was promoted to assistant general freight agent of the same road, which position he held at the time of his recent appointment as assistant to vice-president, as above noted.

John G. Walber, assistant general manager of the Baltimore & Ohio, at Baltimore, Md., has been appointed assistant to third vice-president, and will become head of a new department in charge of matters concerning all employees in the operating branch, with authority over the Baltimore & Ohio, the Baltimore & Ohio Southwestern, the Cincinnati, Hamilton & Dayton, and the Staten Island Lines. Mr. Walber began railway work in 1885 as a clerk on the Ohio & Mississippi; the following year he was made clerk in the office of the president and general manager, and when that road became a part of the Baltimore & Ohio System he was appointed private secretary to the second vice-president and traffic manager at St. Louis, Mo. In March, 1896, he was promoted to chief clerk in the office of the vice-president and general manager at Cincinnati, and subsequently was made assistant general manager. He was then transferred to Baltimore as general superintendent of transportation, and later was made assistant general manager. Mr. Walber's new department is noticed in another column.

Finley J. Shepard has been appointed assistant to the president of the Missouri Pacific-Iron Mountain System, in addition to his duties as assistant to the president of the Denver &

Rio Grande. Mr. Shepard succeeds M. C. Markham, who has been assigned to other duties.

J. M. Johnson, vice-president in charge of traffic of the Missouri Pacific, has been appointed general director of traffic of all the Gould lines west of the Mississippi, with headquarters at St. Louis, Mo., effective January 1.

### Operating Officers.

W. R. McCollom has been appointed terminal trainmaster of the Chicago & Alton, with headquarters at Chicago.

J. B. Stewart has been appointed general manager of the Bangor & Aroostook.

T. H. Conroy, assistant division superintendent of the Colorado & Southern at Cheyenne, Wyo., has been appointed superintendent of the South Park division, with headquarters at Denver, Colo., succeeding J. Dwyer, resigned.

J. Dwyer, superintendent of the South Park division of the Colorado & Southern, with office at Denver, Colo., has been appointed superintendent of the Oregon Electric and the Spokane, Portland & Seattle, with headquarters at Portland, Ore.

C. O. Bradshaw has been appointed trainmaster of the Great Northern, with office at Glasgow, Mont., succeeding W. A. Benton, resigned. B. F. Hillsabeck has been appointed trainmaster, with headquarters at Havre, Mont., in place of W. Carswell, granted a leave of absence on account of ill health.

R. N. Begien, assistant to third vice-president of the Baltimore & Ohio, at Baltimore, Md., has been appointed assistant general superintendent in charge of the territory between Philadelphia, Pa., and Parkersburg, W. Va. A portrait of Mr. Begien and a sketch of his railway career were published in the *Railway Age Gazette* of May 10, 1912, page 1072.

B. R. Pollock, general superintendent of the New York, New Haven & Hartford, at New Haven, Conn., has been appointed general manager, with office at New Haven. C. N. Woodward, superintendent of the Shore Line division, at New Haven, succeeds Mr. Pollock. J. A. Droege, superintendent of the Providence division, at Providence, R. I., succeeds Mr. Woodward, and J. D. Gallary, trainmaster at Providence, succeeds Mr. Droege.

Harry C. Weller, who has been appointed superintendent of the Pocahontas division of the Norfolk & Western, with office at Bluefield, W. Va., was born on April 28, 1871, at Chillicothe, Ohio, and was educated in the public schools. He began railway work on May 2, 1886, as a telegrapher on the Norfolk & Western and was subsequently agent, then train despatcher and later yardmaster on the same road. He was then appointed trainmaster of the Norfolk & Western at Bluefield, which position he held at the time of his recent appointment as superintendent of the same road, as above noted.

A. C. Needles, general superintendent of the Eastern general division of the Norfolk & Western at Roanoke, Va., has been appointed general manager, with office at Roanoke. W. J. Jenks, superintendent of the Pocahontas division, at Bluefield, W. Va., has been appointed general superintendent of the Western general division, with office at Bluefield, succeeding W. S. Becker, assigned to other duties. V. A. Riton, superintendent of the Norfolk division, at Crewe, Va., has been appointed general superintendent of the Eastern general division, with office at Roanoke, succeeding Mr. Needles. H. C. Weller, trainmaster at Bluefield, has been appointed superintendent of the Pocahontas division, with office at Bluefield, succeeding Mr. Jenks. E. A. Blake, superintendent of the Shenandoah division, at Roanoke, has been appointed superintendent of the Norfolk division, with office at Crewe, succeeding Mr. Riton, and J. D. Hester, trainmaster at Roanoke, succeeds Mr. Blake.

Tunice Waldon Parsons, whose appointment as superintendent of the Seaboard Air Line, with headquarters at Tampa, Fla., has been announced in these columns, was born on May 4, 1879, at Anderson, S. C. He was educated in the common schools and began railway work on September 1, 1898, as agent's helper on the Southern Railway, and the following year was appointed relief agent. In 1900 he went



J. G. Walber.



to the Chattanooga, Rome & Southern, now a part of the Central of Georgia, as relief agent and operator, and in 1902 was promoted to extra despatcher and operator. He then went to the Seaboard Air Line as despatcher, first at Cedar-town, Ga., and then at Birmingham, Ala., and was made chief despatcher at Birmingham in 1906. Three years later he was promoted to trainmaster and in 1912 was made assistant superintendent, which position he held at the time of his recent appointment as superintendent of the Florida division of the same road, as above noted.

Richard Colclough, whose appointment as assistant to the general superintendent of the Intercolonial Railway and the Prince Edward Island Railway, with headquarters at Moncton, N. B., has been announced in these columns, was born on February 24, 1871, at Bic, Que. After leaving the common schools he attended Rimouski College, and in 1888 graduated with the degree of B. A. from Laval University, Quebec. He began railway work on December 9, 1889, with the Intercolonial Railway as a clerk in the superintendent's office at Moncton, and has been in the continuous service of that company ever since. From 1892 to November, 1901, he was private secretary to the chief superintendent, then to the general manager, and later to the general superintendent and manager. He was subsequently chief clerk in the manager's office until October, 1902, when he was appointed clerk in the general manager's office and in the office of the managing board. From June, 1911, until the following May he was chief clerk in the general superintendent's office, and in May, 1912, was appointed assistant superintendent of the Halifax & St. John division, which position he held at the time of his recent appointment as assistant to the general superintendent, as above noted.

Arthur C. Needles, who has been appointed general manager of the Norfolk & Western, with office at Roanoke, Va., was born on January 10, 1867, at Baltimore, Md., and was educated in the public schools and at Swarthmore College, Pennsylvania. He began railway work in 1882 as a rodman on the Washington, Ohio & Southern, and in 1883 became a rodman in the engineering department of the Norfolk & Western, and was then yard clerk and brakeman on the same road. In 1884 he was made night and day yardmaster, and from April, 1887, to August, 1890, he was yardmaster first at Pulaski, Va., and then at Bluefield, W. Va. On August 1, 1890, he was appointed assistant trainmaster, and on December 25, 1898, was made trainmaster of the Radford division. He was then for one month assistant superintendent of the Pocahontas division, and in June, 1901, was promoted to superintendent of the Shenandoah division. The following year he was transferred to the Norfolk division. From December, 1902, to February, 1904, he was superintendent of the Pocahontas division and was then made general superintendent of the same road, which position he held at the time of his recent appointment as general manager, as above noted.

Frank M. Barker, whose appointment as assistant superintendent of the Lehigh Valley, with headquarters at Wilkes-barre, Pa., has been announced in these columns, was born on September 2, 1872, at Milford, Del., and was educated in the common schools. He began railway work in March, 1887, with the Pennsylvania Railroad. From November of the same year to July, 1888, he was operator and agent on the New York, Philadelphia & Norfolk, and then until November, 1889, was ticket clerk on the New York Central & Hudson River. From

November, 1889, to September, 1892, he was first operator, then agent, and later train despatcher on the Colorado Midland. He went to the Lehigh Valley in September, 1892, as operator and agent, and in 1900 was made yardmaster at Manchester, N. Y. From May, 1904, to November, 1905, he was with the Chicago, Rock Island & Pacific as yardmaster and then as general yardmaster. In November, 1905, he returned to the service of the Lehigh Valley as agent at Rochester, N. Y., and from April, 1909, to January, 1910, was general yardmaster at Sayre, Pa. He was made trainmaster of the Auburn division in January, 1910, and the following December was promoted to inspector of transportation, which position he held at the time of his recent appointment as assistant superintendent of the Wyoming division of the same road.

Thomas J. Foley, whose appointment as general manager of the Illinois Central and Yazoo & Mississippi Valley, with headquarters at Chicago, has been announced in these columns, was



T. J. Foley.

born at Convoy, Ohio, in 1866. He began railway work when 12 years of age as a telegraph operator for the Pennsylvania Lines West of Pittsburgh. The following year he was made agent; in 1880 he was promoted to train despatcher at Ft. Wayne, Ind., and in 1893 became chief train despatcher. He was later appointed assistant trainmaster, and in 1897 was advanced to the position of transportation inspector of the Pennsylvania Lines. On June 1, 1901, Mr. Foley accepted the position of assistant to the general manager of the Baltimore & Ohio, with headquarters at Baltimore,

Md., and subsequently until 1906 was superintendent of the Chicago division and general superintendent of the Wheeling system. He then went to the Union Pacific as special inspector of the transportation department, and later was yardmaster and chief train despatcher at Cheyenne, Wyo., superintendent of terminals at Omaha, Neb., and assistant superintendent of the Nebraska division. He left the Union Pacific on March 15, 1910, to become assistant to the vice-president of the Illinois Central, and shortly afterward was made assistant general manager of that road, the Yazoo & Mississippi Valley and the Indianapolis Southern, from which position he recently was advanced to that of general manager, as noted above.

#### Traffic Officers.

P. F. Murphy has been appointed contracting freight agent of the Toledo, St. Louis & Western, with office at St. Louis, Mo.

H. W. Prickett has been appointed general agent of the traffic department of the Chicago & Alton, with office at Salt Lake City, Utah.

W. L. Nichol, commercial agent of the Nashville, Chattanooga & St. Louis, at Nashville, Tenn., has been appointed general freight agent, with headquarters at Nashville.

Roy E. Pinniger has been appointed freight solicitor of the Star Union Line, with office at Milwaukee, Wis., succeeding S. F. Trudelle, resigned to engage in other business.

H. P. Cornick has been appointed assistant general freight agent of the St. Louis and Henderson divisions of the Louisville & Nashville, with headquarters at Evansville, Ind.

W. G. Wagner, division freight agent of the Chicago, Burlington & Quincy, with office at Burlington, Ia., has been appointed assistant general freight agent of the Illinois & Iowa



A. C. Needles.

district of the lines east, with headquarters at Chicago, to succeed H. H. Holcomb, promoted. H. A. Pence succeeds Mr. Wagner.

E. G. Mustain, traveling freight and passenger agent of the El Paso & Southwestern at El Paso, Tex., has been appointed division freight and passenger agent, with office at Tucson, Ariz.

Earl D. Lamiman has been appointed traveling freight and passenger agent of the Missouri Pacific and the St. Louis Iron Mountain & Southern, with headquarters at Tacoma, Wash.

Frank J. Lambert, city ticket agent of the Lehigh Valley at Philadelphia, Pa., has been appointed traveling passenger agent, with office at Philadelphia, succeeding John L. Kirkpatrick, deceased.

G. E. Chase, commercial agent of the Chicago, Milwaukee & St. Paul at Buffalo, N. Y., has been appointed southwestern passenger agent, with office at Kansas City, Mo., succeeding G. L. Cobb, promoted.

S. B. Adams has been appointed traveling passenger agent of the Norfolk & Western, with office at Indianapolis, Ind. R. E. Scott has been appointed passenger agent at Portsmouth, O., in place of Mr. Adams.

C. E. Jenney, traveling passenger agent of the Grand Trunk at Toronto, Ont., has been appointed traveling passenger agent, with office at Pittsburgh, Pa., succeeding W. Robinson, deceased and W. J. Moffatt succeeds Mr. Jenney.

A. J. Russell has been appointed assistant general freight agent of the Pere Marquette Line steamers, in charge of lumber and salt traffic, with headquarters at Ludington, Mich. The office of salt traffic manager is abolished.

W. B. Beville, general passenger agent of the Norfolk & Western, at Roanoke, Va., has been appointed passenger traffic manager, with office at Roanoke, and W. C. Saunders, assistant general passenger agent at Roanoke, succeeds Mr. Beville. J. R. Ruffin, general freight agent at Roanoke, has been appointed freight traffic manager, with office at Roanoke. De Los Thomas, assistant general freight agent at Roanoke, succeeds Mr. Ruffin. S. S. Bridgers, assistant general freight agent at Columbus, Ohio, has been promoted to assistant general freight agent at Roanoke, and B. W. Herrman, general agent at Cincinnati, Ohio, succeeds Mr. Bridgers and G. C. Van Zandt succeeds Mr. Herrman.

Walter B. Beville, who has been appointed passenger traffic manager of the Norfolk & Western, with office at Roanoke, Va., was born on February 21, 1856, at Richmond, Va., and began railway work on May 31, 1873, as a clerk in the general freight agent's office of the Richmond & Danville, now a part of the Southern Railway, and from November, 1875, to September, 1880, he was in the general passenger agent's office of the same road. In September, 1880, he became chief clerk to the general passenger agent of the Associated Railways of Virginia and the Carolinas, and from October, 1882, to March, 1886, was chief clerk to the general passenger agent of the Virginia, Tennessee & Georgia Air Line. Since March, 1886, he has been general passenger agent of the Norfolk & Western Railroad, and its successor, the Norfolk & Western Railway, and now becomes passenger traffic manager, as above noted.

DeLos Thomas, who has been appointed general freight agent of the Norfolk & Western, with office at Roanoke, Va., was born near Utica, N. Y., in 1861, and was educated in the common schools. He learned telegraphy and entered the service of the Utica & Black River as telegraph operator, and in 1880 was made train despatcher. He was then chief clerk to the general freight agent until the Utica & Black River became a part of the Rome, Watertown & Ogdensburg in May, 1886, when he became chief rate clerk in the general freight office of that road. Two years later he was promoted to chief clerk, and in December, 1890, became chief clerk of the Great Southern Despatch at Roanoke, Va. He was subsequently chief clerk to the assistant general freight agent and then to the general freight agent of the Norfolk & Western and was later promoted to division freight agent at Winston-Salem, N. C. In the spring of 1908 he was made assistant general freight agent of the Norfolk & Western, also man-

ager of the Great Southern Despatch, the Southern States Despatch and the Shenandoah Despatch, and now becomes general freight agent of the Norfolk & Western, as above noted.

#### Engineering and Rolling Stock Officers.

W. L. Rohbock, acting chief engineer of the Wheeling & Lake Erie at Cleveland, Ohio, has been appointed chief engineer, with headquarters at Cleveland.

#### Special Officers.

Charles Clarke, division freight agent of the Grand Trunk, at Detroit, Mich., has been appointed assistant commissioner of industries for lines west of Detroit and St. Clair rivers, with office at Detroit.

#### OBITUARY.

George Albert Kimball, chief engineer of the Boston Elevated Railway Company, died on December 4, at his home in Arlington, Mass., at the age of 62.

George W. Markley, supervisor of bridges and buildings of the Peoria & Eastern, with headquarters at Urbana, Ill., died in the latter city on December 2.

George T. Rowe, commercial agent of the Lake Shore & Michigan Southern at Cleveland, Ohio, died at that place on December 2, following an operation for appendicitis.

Joseph B. Cavanaugh, formerly for several years general freight agent of the Wisconsin Central Lines, and later engaged in the coal business in Chicago, died in the latter city on December 2, aged 51 years.

James Keeler, who died at his home in New York City, on November 28, at the age of 80, was long connected with the Panama Railroad, and for some years previous to 1874 was secretary of that company.

Alexander G. Hackstaff, vice-president of the Illinois Central at New York, and a director of the company, died on November 28, at his home in that city. He was born on May 16, 1852, at Middletown, Conn., and began railway work in 1871 as a civil engineer on the Pennsylvania Railroad. He went to the Illinois Central in 1880 as a clerk in the president's office at Chicago. In May, 1887, he was appointed acting secretary of the same road, and on March 19, 1888, was made secretary. He was elected third vice-president of the Illinois Central in 1901. In January, 1907, the practice of designating the several vice-presidents by numbers was discontinued. He was also a director of the Central of Georgia and of the United States Express Company.

ENGINEMAN IMPRISONED FOR NEGLIGENCE.—In Germany, last June, an engineman overran a signal set against him and caused a collision by which three persons were killed and 28 injured, some of them severely. The criminal court at Leipsic tried him for criminal negligence and sentenced him to 15 months' imprisonment.

NEW STATION FOR LIMA, PERU.—The Peruvian government last year approved the plans for the construction of a new and commodious central railway station in Lima on the site of the present Desamparados Station, and this structure will soon be finished. The new station has been much needed for some time and is said to be thoroughly modern in all its features.

OFFER TO BUILD URUGUAYAN RAILROADS.—The Regie Générale de Chemins de Travaux Publics has offered to construct the railroads desired by the Uruguayan government so as to allow a speed of 55 miles per hour, the gage to be 4 ft. 5 in., for \$42,000 per mile, including financing, construction, and equipment expenses. When 31 miles have been built the first payment is to be made in government bonds bearing 4½ per cent. interest and one-half of 1 per cent. amortization. The company also offers to organize a company to operate the lines when finished, on the basis of a maximum guaranty of 2 per cent on the cost of \$42,000 per mile.



## Equipment and Supplies.

### LOCOMOTIVE BUILDING.

THE ILLINOIS CENTRAL is making inquiries for 25 locomotives.

THE YOSEMITE VALLEY is making inquiries for 1 locomotive.

THE OREGON SHORT LINE is in the market for 10 locomotives.

THE KENTWOOD & EASTERN is making inquiries for 1 locomotive.

THE DULUTH & IRON RANGE is making inquiries for 13 locomotives.

THE CHILEAN STATE RAILWAYS are making inquiries for 10 locomotives.

THE FLORIDA EAST COAST is making inquiries for from 5 to 10 locomotives.

THE DENVER, NORTHWESTERN & PACIFIC is making inquiries for 2 locomotives.

THE AKRON & BARBERTON BELT has ordered 1 mogul locomotive from the Baldwin Locomotive Works.

THE NEWBURGH & SOUTH SHORE has ordered 2 six-wheel switching locomotives from the Baldwin Locomotive Works.

THE DETROIT & TOLEDO SHORT LINE has ordered 3 six-wheel switching locomotives from the Baldwin Locomotive Works.

BUTLER BROTHERS, St. Paul, Minn., have ordered an additional switching locomotive from the Baldwin Locomotive Works.

THE MAHONING ORE & STEEL COMPANY has ordered 3 six-wheel switching locomotives from the Baldwin Locomotive Works.

THE DELAWARE, LACKAWANNA & WESTERN has ordered 12 mikado locomotives, 7 Pacific type freight locomotives, and 3 Pacific type passenger locomotives from the American Locomotive Company.

THE SOLVAY PROCESS COMPANY has ordered 1 six-wheel switching locomotive from the American Locomotive Company. The dimensions of the cylinders will be 19 in. x 24 in.; the diameter of the driving wheels will be 51 in., and the total weight in working order will be 122,000 lbs. These locomotives are for use on the Delray Connecting Railroad.

### CAR BUILDING.

THE NORTHERN PACIFIC will build 500 flat cars in its own shops.

THE NEW YORK CENTRAL LINES are in the market for 7,000 box cars and 2,100 gondola cars.

THE CENTRAL OF NEW JERSEY is in the market for 12 vestibule passenger cars and 9 combination cars.

THE ATLANTIC COAST LINE has ordered 300 flat cars from the Mt. Vernon Car & Manufacturing Company.

THE CANADIAN PACIFIC has ordered 800 flat cars, 200 stone cars and 500 ballast cars from the Canadian Car & Foundry Company.

THE PHILADELPHIA & READING has ordered 35 vestibule passenger cars and 15 combination cars from the Harlan & Hollingsworth Corporation.

THE PITTSBURGH & LAKE ERIE ordered 3,000 hopper cars, divided equally between the Pressed Steel Car Company, the Standard Steel Car Company and the American Car & Foundry Company. This item has not been confirmed.

THE CHICAGO, MILWAUKEE & ST. PAUL has ordered 10 combination postal and baggage cars, and 23 postal cars from the American Car & Foundry Company, and will build 3,000 box cars at its own shops in addition to the 3,000 mentioned in the issue of October 25, for which the underframes have been ordered from the Bettendorf Axle Company.

### IRON AND STEEL.

THE PENNSYLVANIA RAILROAD has ordered 58,000 tons of rails.

THE LEHIGH VALLEY has ordered 10,000 tons of rails from the Carnegie Steel Company, 10,000 tons from the Pennsylvania Steel Company, and about 15,000 tons from the Bethlehem Steel Company.

GENERAL CONDITIONS IN STEEL.—The steel trade in November was sharply contracted in volume compared with the record-breaking transactions in October, but the sales were above the average monthly transactions during the preceding ten months. Since the first of December there has been a lull in new business, but some large transactions are still pending which will call for a heavy tonnage of steel in the next few months. Railroad buying of equipment is far from over. It is believed that a large number of cars and a heavy tonnage of rails will be ordered before the end of the year. Orders will probably show a further falling off after the first of the year, due to the fact that various steel companies are booked from six to nine months ahead, and to possible tariff revision. Consumers always exhibit caution pending a change in the tariff. In this connection, however, the mills have sufficient orders on their books to keep their plants in operation for from six to nine months, so that no falling off in mill activity is expected before Congress takes up the question of tariff revision in April. Prices will probably remain at their present level for some time.

### SIGNALING.

The New York, Philadelphia & Norfolk plans to introduce the manual block system on 17 miles of its line during the coming year.

The signaling plans of the Chicago, St. Paul, Minneapolis & Omaha for the year 1913 include the installation of automatic block signals on 63.7 miles of road, double track. Automatic block signals are under construction at the present time on a length of 19 miles, double track.

The Oregon-Washington Railroad & Navigation Company expects to install automatic block signals on 110 miles of its line during the coming year as follows: Spokane, Wash., to Ayer, Wash., single track, 100 miles; Seattle, Wash., to Georgetown, Wash., double track, four miles; Georgetown, Wash., to Black River Junction, single track, six miles. The company plans also to install three power and one mechanical interlocking plants as follows: Argo, Wash., electro-pneumatic, 47 levers. Material from the Union Switch & Signal Company; plant to be installed by railroad company. East Portland, Ore., all-electric interlocking; 88 levers, material from the General Railway Signal Company; plant to be installed by road. Centralia, Wash., mechanical interlocking plant with electric motor home and distant signals, 24 levers. Contract not yet awarded. Black River Junction, Wash., all-electric interlocking, 24 levers. Contract not yet awarded. At East Spokane, Wash., the present electric interlocking plant of 52 levers is to be enlarged to 64 levers.

CONSTRUCTION IN NEW SOUTH WALES.—Construction work has been begun on the new line from Galong, New South Wales, to Burrowa.

CONSTRUCTION IN PORTUGUESE WEST AFRICA.—The Benguela Railway, in Portuguese West Africa, has been completed from the Atlantic coast eastward 223 miles, and is in progress 137 miles further. A further extension of 311 miles will bring it to the border of the Congo Free State, near the famous Katanga copper mines, which are approached from the south by a railway line from British South Africa. The distance to Katanga from Benguela is much less than from the South African ports, which are further from Europe by two or three days' sail. Part of the Benguela line is a cogwheel railway, beginning about 30 miles from the coast. The gage is 3 ft. 6 in., which now commonly goes by the name of "the Cape gage." The rails weigh 60 lbs. per yard, and are laid on steel ties weighing 64 lbs. and spaced 2 ft. 6 in. apart. Briquettes from England are used as fuel.

## Supply Trade News.

Walter Rachals, formerly chief engineer of the National Steel Company until that company was consolidated with the Carnegie Steel Company, Pittsburgh, Pa., has resigned his position in charge of the engineering office of Julian Kennedy, New York, to take a position in the iron and steel works department at Pittsburgh, Pa., of the Westinghouse, Church, Kerr & Company, New York.

The Pullman Company now has approximately 12,000 men on its payroll in the manufacturing department, as compared with an average of 7,645 in the last fiscal year, of which 3,000 are working overtime. The freight car department is running at about 75 per cent. of its capacity, with orders for about 14,000 cars on the books. The passenger department is running at nearly full capacity.

The Lehon Company, Chicago, manufacturers of protective products, has just completed a large addition to its roofing and insulating mill at Forty-fifth street and Western avenue, Chicago. The output of the concern has been practically doubled by recent improvements. The company is now furnishing its Per-Bona insulating paper for the 3,000 Harriman Line refrigerator cars recently ordered.

John G. Berquist has resigned as works manager of the Universal Portland Cement Company, Chicago, but will maintain a connection with the company as consulting engineer. Leonard Wesson, superintendent of Plant No. 2 at South Chicago, has been transferred to the general office of the company as assistant to President Edward M. Hagar. Nels Nelson, who has been assistant superintendent of Plant No. 2, has been promoted to superintendent.

William Marshall, president of the Anglo-American Varnish Company, Newark, N. J., died at his home in Asbury Park, N. J., on December 1. Mr. Marshall was born at Edinburgh, Scotland, on January 18, 1848. He entered the varnish business in 1860 in London, England, with Pontifice & Wood, where he familiarized himself with English methods. In 1871 he came to America, and in the following year he began business on his own account in Newark. In 1890 he formed the Anglo-American Varnish Company, of which he was made president. Mr. Marshall had been instrumental in building up a large varnish business, particularly with the railroads, and was considered an authority on the manufacture and uses of varnish. He was an active member of the New York Railroad Club, the New England Railroad Club, the Western Railroad Club, the Railway Business Association, and the supplymen's association, which is connected with the Master Car and Locomotive Painter's Association. He was also a director of the Asbury Park Trust Company.

### TRADE PUBLICATIONS.

**HYDRO ELECTRIC DEVELOPMENT.**—J. G. White & Co., Inc., New York, have published an attractive illustrated booklet, entitled *The Power of Ocoee*, which gives a description of a hydro electric development on the Ocoee river at Parksville, Tenn., built for the Eastern Tennessee Power Company.

**ILLUMINATION.**—The Illuminating Engineers' Society, New York, has published a booklet, entitled *Light; Its Use and Misuse*, which has already gone into a second edition, though it appeared only a month ago. Several lighting companies are planning to issue this booklet to their customers, and one large manufacturing company in London, England, has cabled for permission to print and distribute a large edition in Europe.

**REFUSE DESTRUCTORS.**—The Griscom-Russell Company, New York, has published an interesting catalog of its Sterling destructors which destroy refuse by incineration. The most successful work along these lines is based on British practice, and this company has secured the co-operation and advisory experience of Hughes & Sterling, an English house of wide experience, and also full right under the Sterling patents and designs. The catalog illustrates and describes a number of installations.

## Railway Construction.

**ARIZONA EASTERN.**—A contract has been given to MacArthur Bros. Co., Chicago, to build an extension from Miami, Ariz., to Live Oak & Inspiration Copper Company's property, 2.3 miles.

**CHICAGO, MILWAUKEE & ST. PAUL.**—This company completed 13,193,485 cu. yds. of grading during the months June to October, inclusive, principally in Iowa, Minnesota, and South Dakota, in connection with revision of alignment and double-tracking. In August the amount of grading aggregated 3,138,427 cu. yds. The figures do not include the work done on the Chicago, Milwaukee & Puget Sound.

**CLARKSBURG & NORTHERN.**—An officer writes that grading work has been finished from New Martinsville, W. Va., south to Middlebourne, 13 miles. Joseph Fuccy, New Martinsville, is the contractor. An extension is projected from Middlebourne southeast to Clarksburg, 32 miles.

**CLEAR LAKE.**—An officer writes that this company is building with its own forces from Hopland, Cal., northeast to Lakport, 24 miles. C. R. Rankin, chief engineer, Hopland. (May 24, p. 1180.)

**DOMINION ATLANTIC.**—An officer writes that a contract has been given to Kirk & Cooke, North Sydney, N. S., to build an extension from Centreville, N. S., to Weston, 14.7 miles.

**HILLSBORO & NORTHEASTERN.**—An officer writes that the company is building with its own forces an extension from Hillsboro, Wis., to Richland Center, 28 miles.

**IDAHO & WASHINGTON NORTHERN.**—An officer writes that surveys are being made for an extension from Metaline Falls, Wash., to Trail, B. C., 40 miles.

**JAMESTOWN RAILROAD.**—An officer writes that contracts are to be let in February to build from Glen Mary, Tenn., southeast to Jamestown, 25 miles. There will be two steel bridges and six trestles on the line. The company expects to develop a traffic in lumber and coal. O. H. Anderson, president, Sparta, Tenn., and W. O. Dyer, chief engineer, Oneida.

**LOUISIANA TRACTION & POWER COMPANY.**—Organized in Louisiana, with headquarters at Lafayette, to build 140 miles of electric lines, surveys are now being made. E. C. Shackford, for many years connected with the Southern Pacific lines, and for the past seven years superintendent of the lines in Louisiana, is general superintendent of the new company, with headquarters at Lafayette.

**MANISTEE & REPTON.**—An officer writes that the company expects to begin work soon on an extension from Monroeville, Ala., to Monroe, 3 miles; also on an extension from Snider, to Maros, 12 miles. The company will carry out the work with its own forces. August 30, p. 409.)

**MERIDIAN & MEMPHIS.**—An officer writes that J. A. Perdue & Co., Meridian, Miss., who has the contract to build from Meridian northwest to Union, 32 miles, has been given a contract to also build from Meridian east to Myrtlewood, Ala., 47 miles.

**MEXICO NORTH WESTERN.**—An officer writes that contracts have been given to Bowman & Larson, Dublin, Chihuahua, and to William E. Orr, El Paso, Texas, for work on the sections from Pearson, Mex., to Pacheco, 33 miles, and from Cumbre, to Black Hawk, 17 miles. A reconnaissance has been made from Chico south to Topolobampo, and it is probable that the company will build over this route to the Pacific.

**MEXICO WESTERN.**—This is the new name of the Nazas Valley & Pacific, which was organized last year. The plans call for building from the National Railways of Mexico at Tepehuanes, Mex., to Culiacan. The first section from Tepehuanes to Guanacevi is being permanently located. Financial arrangements have been made, and it is expected that contracts for the work will be let early in 1913. J. T. O'Dell, New York, is interested.

**MISSOURI & NORTH ARKANSAS.**—This company is building with its own forces a one-mile extension from mile post 359 to Helena, Ark.



NASHVILLE, CHATTANOOGA & ST. LOUIS.—This company expects to lay second track from Stevenson, Ala., to Shellmound, 16.9 miles; also on 3.5 miles between Nashville, Tenn., and Glenciff.

NAZAS VALLEY & PACIFIC.—See Mexico Western.

NEW YORK, ONTARIO & WESTERN.—Work is now under way laying two miles of second track from Carbondale, Pa., to Mayfield yard, and on 0.25 miles at Cadosia, N. Y. Both of these sections are on the Scranton branch and the work includes building viaducts over the valleys.

QUEBEC & LAKE ST. JOHN.—An officer writes that work is now under way on a 30-mile extension from Roberval, Que., north. J. P. Mullarkey, Montreal, has the contract.

PALACIOS, SAN ANTONIO & PECOS VALLEY.—An officer writes that financial arrangements have been made to build the first section from Palacios, Tex., northwest via Blessing, Edna, Francitas and Fordtran to Yoakum, about 80 miles. The line is to be built through a farming district and the company expects to develop a traffic in cattle, rice, fruit, cotton, timber and other commodities. The company is planning to let contract for work on 55 miles, and has about 20 miles of grade that only requires surfacing. There will be a number of short span bridges on the line and some shop buildings, and stations will be built. U. G. Dotson, president, Palacios.

RALEIGH, CHARLOTTE & SOUTHERN.—An officer writes that work is now under way by Kenefick, Hoffman & Company, Charlotte, N. C., building the extension from Mt. Gilead, N. C., to Charlotte, 53 miles. (September 6, p. 453.)

SEABOARD AIR LINE.—The report of this company for the year ended June 30, 1912, shows that the extension from Fruitville, Fla., to Venice, 16.53 miles, was completed. The extension of the Dunnellon line to Inverness with a spur to Holder mines, 8.52 miles, was also completed. Spurs have been built from the Dunnellon line to Camp Phosphate Company's Barr mine, 2.14 miles, and from the old P. C. A. & G. line near Alafia to the State Phosphate Company's mine, 1.30 miles. Construction work is now under way on the extension from Mulberry, Fla., to Bartow, with a branch to the Royster mine, about 12 miles. During the year 61 miles of new sidings and extensions of existing sidings were constructed, and about 124 miles of new 75-lb. and 85-lb. steel rails were laid on the main line, replacing lighter sections or worn 85-lb. rail. Extensions were made to the yards at Wilmington, N. C., at Savannah, Ga., and at Jacksonville, Fla., and new yards and mechanical facilities are now being constructed at Norlina, N. C., and at Cayce, S. C. During the year 256,071 cu. yds. of gravel and slag ballast were put under main line track, and 10,435 lineal ft. of wooden trestles were filled in, the latter work included the filling of the Lincoln street trestle at Columbia, S. C.

SMITH-POWERS LOGGING COMPANY'S LINE.—An officer writes that a contract has been given to Willett & Burr, San Francisco, Cal., to build a logging line from Myrtle Point, Cal., to Powers. C. A. Smith is president, and S. A. Haines, chief engineer, Myrtle Point.

TIDEWATER & WESTERN.—An officer writes that surveys are being made to build an extension from Flat Rock, Va., to South Richmond, 27.6 miles.

UNITED RAILROAD OF YUCATAN.—An officer writes that a contract has been given to Ramon Mon y Hermano, Merida, Yucatan, Mex., to build from Espita, Yucatan, to Tizimin, 16.5 miles.

#### RAILWAY STRUCTURES.

ALBUQUERQUE, N. M.—The Atchison, Topeka & Santa Fe is planning to build new shops and terminals, including car shops, roundhouse, boiler, machine and blacksmith shop, and other buildings.

BRUNSWICK, GA.—The Southern Railway has let a contract for putting up a storage warehouse at Brunswick. The new structure is to be 300 ft. long x 100 ft. wide. It will have reinforced concrete foundation walls, concrete floors and fireproof roof.

GLEN MARY, TENN.—See Jamestown Railroad under Railway Construction.

RALEIGH, N. C.—The report of the Seaboard Air Line for the year ended June 30, 1912, shows that the additional terminal facilities at Raleigh, N. C., at Wilmington, and at Savannah, Ga., have been completed, and work on additional terminal improvements is now under way at Wilmington, at Savannah and at Jacksonville, Fla. The union passenger stations at Weldon, N. C., and at Tampa, Fla., have been completed, and union passenger stations have been provided at Ocilla, Ga., and at Bostic, N. C.; a union station at Vidalia, Ga., is now under construction. Modern passenger stations were built during the year at Athens, Ga., at Abbeville, S. C., at Leesburg, Fla., and at Richland, Ga., and at Savannah a new reinforced concrete roundhouse, and modern steel and concrete machine and erecting shops and power house were built to replace the wooden structures which were destroyed by fire. A total of 69 stations and freight houses were constructed or added to during the year. Work has also been carried out on 44 bridges, replacing existing structures with steel or strengthening them for heavy traffic. Of this number, 25 have been completed, and the remaining 19 will be finished by June, 1913.

NEW LINE FOR NEW SOUTH WALES.—It is estimated that the proposed line from Grenfell, New South Wales, to Warraderry, will cost about \$500,000, with 60-lb. rails. The new railway would be 20 miles long and the ruling grade would be 1 per cent.

PERUVIAN LINE TAKEN OVER BY THE GOVERNMENT.—The decree of January 26, 1912, canceling the concession of the Northwestern Railway Co. of Peru, Ltd., for building the Lima-Huacho Railway, on the ground of nonfulfillment of contract, provided that the Peruvian government should exercise its option of expropriating the constructed part of the line, paying its value with a discount of 10 per cent. and taking possession of the line so expropriated, or of leaving the property and its operation to the concessionaires on the conditions stipulated in the contract, with the exception of the payment of interest. The government chose the former alternative as being more favorable to the credit and reputation of the country and now operates the road. The first locomotive of the Lima-Huacho Railway entered the town of Huacho on December 13, 1911, and the road is now in active operation from Ancon to Huacho, the traffic from Lima to Ancon being handled by the Central Railway.

IMPORTANT AFRICAN LINE PROPOSED.—A great scheme for the construction of a 3,000-mile railway through central Africa, at a cost roughly estimated at \$50,000,000, has been revived by the termination of the war between Italy and Turkey and the cession of Tripoli to the former power. The scheme was originally mooted 30 years ago by a London firm of contractors and engineers, but it was not proceeded with owing to differences between the Bey of Tripoli and the Sultan of Turkey. It was favored by the late King Humbert of Italy. In order to place the scheme on a proper footing it will be necessary now to obtain concessions from the three governments through whose territories the proposed line will pass—namely, Italy, France, and Belgium. A London man who was interested in the original scheme, and is now moving in the matter, expresses the belief that no difficulty will be experienced in obtaining the guarantees for the whole of the money required, as the line would provide for the great commercial centers of Europe a convenient access to the fertile regions of central Africa, which, as far as the Stanley Falls, are at present served only by caravan routes. The possibilities of the enterprise for commercial purposes are claimed to be incalculable. Starting from the city of Tripoli, on the Mediterranean, the railway will go right down through Fezza to Tibesti, and thence through the French territory of Darfur. From there it will take a southeastern route through the Belgian Congo to the Stanley Falls, near Lake Tanganyika, where it will join the Cape to Cairo Railway, which will soon be nearing completion. It will act, of course, as a very important feeder to that great enterprise. It is stated that by this new line the journey from London to central Africa will be possible in about a week, and that the traffic between central Europe and so important a center must become enormous. London contractors are already considering the scheme, and negotiations are about to be opened to secure the necessary concessions from the three governments concerned before beginning actual preliminaries of surveying and financing the enterprise.—*London Financial Times*.

## Railway Financial News.

**ARIZONA EASTERN.**—The Arizona Corporation Commission has authorized the Arizona Eastern to issue \$600,000 bonds for improvements.

**BELT RAILWAY.**—See Chicago & Western Indiana.

**BIRMINGHAM & GULF RAILWAY & NAVIGATION.**—This property is to be sold under foreclosure on December 30, to satisfy a lien of \$690,792, subject as to a portion of the property to a mortgage for \$100,000. There are 11 miles of road between Tuscaloosa and Holt, Ala. The upset price has been fixed at \$75,000.

**CANADIAN NORTHERN.**—The committee which has been appointed to investigate the application of the Canadian Northern to buy the London & Port Stanley, which runs from London to Stanley Beach, Ont., 24 miles, is to recommend to the city council of London, Ont., that the offer made by the C. N. be accepted. The company proposes either to buy the road or to lease it, paying a small rental and sharing the additional profits with the city of London, which now owns the property. Trackage rights may be accorded to the Pere Marquette and the Michigan Central between London and St. Thomas, the Canadian Northern, however, retaining the exclusive right to operate trains to Port Stanley.

**CANADIAN NORTHERN QUEBEC.**—W. A. Faulkner & Co., Winnipeg, Man., are offering \$100,000 par value statutory 5 per cent. income stock at 13.

**CHICAGO & WESTERN INDIANA.**—This property has been leased under a new lease for 50 years, dated November 1, 1912, to the Belt Railway. The property leased includes the Chicago Union Transfer.

**CHICAGO UNION TRANSFER.**—See Chicago & Western Indiana.

**GEORGIA & FLORIDA.**—Shillard-Smith, Daniel & Co., Philadelphia, are offering in London \$1,000,000 first mortgage 5 per cent. 50-year bonds of the total authorized issue of \$12,000,000 bonds, of which \$5,595,000 are outstanding. The road runs from Augusta, Ga., to Madison, Fla., and has a total of 322 miles owned and 30 miles operated under trackage rights.

**GREAT NORTHERN.**—The directors have voted to issue \$21,000,000 additional stock to be offered to stockholders of record December 21, at par to the extent of 10 per cent. of their present holdings.

**KANSAS CITY OUTER BELT & ELECTRIC.**—The receivers have applied to the United States district court to issue receivers' certificates to pay current expenses.

**LONDON & PORT STANLEY.**—See Canadian Northern.

**LOUISVILLE, HENDERSON & ST. LOUIS.**—This company has issued \$300,000 4½ per cent. equipment notes maturing from 1913 to 1922.

**MIDLAND VALLEY.**—Holders of the \$1,796,500 coupon notes, due principal and interest on December 1, 1912, are asked to deposit these notes with Drexel & Co., Philadelphia. The committee, of which E. T. Stotesbury is chairman, asks the deposit "in anticipation of the probable default of the payment of these notes."

**MISSOURI PACIFIC.**—E. J. Merrill, president of the Union Trust Company, New York, has been elected a director and a member of the executive committee, succeeding Frederick T. Gates, resigned.

**NEW YORK CONSOLIDATED RAILROAD.**—This company has been incorporated in New York with an authorized capital of \$18,900,000. The company is to consolidate the Brooklyn Union Elevated, the Sea Beach Railway and the Canarsie Railroad. These three companies are subsidiaries of the Brooklyn Rapid Transit, and the consolidation is for the purpose of simplifying the building of the Brooklyn Rapid Transit's share of the new subways for New York.

**NORFOLK & WESTERN.**—The office of chairman of the board, which was held by Henry Fink until his death in July, has been abolished.

**NORTHERN PACIFIC.**—The New York Stock Exchange has listed \$1,040,000 additional prior lien 4 per cent. bonds, the proceeds of the sale of which were used to pay for double track work.

**NORWOOD & ST. LAWRENCE.**—The New York Public Service Commission, Second district, has authorized this company to issue \$200,000 first mortgage 5 per cent. bonds to be sold at 90, the proceeds to be used for reimbursing the treasury for capital expenditures already made. The road runs from Norwood to Waddington, N. Y.

**PENNSYLVANIA & ROCHESTER.**—This is the name of the company which has taken over the Genesee Valley Canal Railroad and the Genesee Valley Terminal Railroad. These roads are leased to the Western New York & Pennsylvania, a subsidiary of the Pennsylvania Railroad. They operate a total of 104 miles in the neighborhood of Rochester, N. Y.

**PENNSYLVANIA COMPANY.**—See Vandalia.

**RIO GRANDE.**—This subsidiary of the St. Louis & San Francisco, which runs from Brownsville to Point Isabel, Tex., 22 miles, has authorized an issue of \$1,000,000 bonds for improvements and extensions subject to the valuation of the railroad commission.

**ST. LOUIS SOUTHWESTERN.**—Application is to be made to the Texas legislature, which convenes in January, 1913, to authorize the St. Louis Southwestern of Texas to buy and consolidate with its own line the Stephenville North & South Texas.

**SOUTHERN PACIFIC.**—Stockholders have formed a committee to protect the interests of the stock of the Southern Pacific company in the hands of the public. The committee, with J. N. Wallace, chairman, is made up of Henry Evans, president of the Continental Fire Insurance Company; J. Horace Harding, of C. D. Barney & Co., organizer of the protective committee of stockholders in the Wabash reorganization, Frederick Strauss, of J. & W. Seligman, bankers, and Albert Wiggin, president of the Chase National Bank.

**STEPHENVILLE NORTH & SOUTH TEXAS.**—See St. Louis Southwestern.

**VANDALIA.**—Stockholders have declared a dividend of 4 per cent. on the \$14,606,750 stock, of which the Pennsylvania Company holds \$11,633,400. From 1907 to 1910, inclusive, 5 per cent. yearly was paid; in 1911, 4 per cent. was paid, and, as mentioned above, in 1912, 4 per cent. will have been paid.

**IMPROVED SERVICE IN JAPAN.**—The Japanese have so far improved their railways that the journey between Tokio and Peking, a distance of 1,590 miles, is now made in 83½ hours, nearly 9 of which are required for the steam ferry journey from Shimonoseki, the southwestern point of Japan, to Fusan, in Corea, 112 miles. The Japanese operate not only the Japanese, but the Korean and Manchurian lines; the Chinese operate the 410 miles from Mukden to Peking. The average speed by rail is about 21½ miles an hour in Japan and 20 miles in China. A train is run through to Shimonoseki, with sleeping cars and an observation car. So far the railroads are of narrow gage. This train also connects with the Siberian Railway.

**EXCESSIVE TRAFFIC IN PRUSSIA.**—The Prussian State Railways in the Rhine valley were so crowded with traffic in October that, after consultation with the commercial organizations of the chief cities, it was determined to refuse all carload shipments for four consecutive days, October 26 to 29, by which time it was hoped that the blockade would be removed. At some of the coal mines, work had to be suspended because cars could not be had. Not all the lines in the district were closed to shipments; those leading to the docks on the Rhine, by which a very large part of the coal reaches a market, and others to iron works and factories, mostly not distant, remained open for carload shipments; and it was argued that, this being known beforehand, the mines, etc., would continue to operate and supply and stock up at the places accessible by short hauls. In one mining district the cars supplied were 9,177 less than the number ordered on October 22, and in one week the shortage was 43,665 cars. Hundreds of thousands of tons of coal have been dumped at the mines.



## ANNUAL REPORT

## SEABOARD AIR LINE RAILWAY—TWELFTH ANNUAL REPORT.

REPORT OF THE DIRECTORS FOR THE FISCAL YEAR ENDED  
JUNE 30, 1912.

New York, September 26th, 1912.

To the Stockholders of the Seaboard Air Line Railway:

The Board of Directors submits the following report of the operations of your property for the year ended June 30, 1912:

GENERAL INCOME ACCOUNT RAIL AND WATER LINES.  
FOR YEAR ENDED JUNE 30, 1912.

	1912.	1911.	Increase.
Gross Revenue .....	\$23,744,447.17	\$22,606,452.72	\$1,137,994.45
Operating Expenses and Taxes. 17,926,895.20		15,999,851.84	1,927,043.36
Operating Income .....	\$ 5,817,551.97	\$ 6,606,600.88	\$ *789,048.91
Other Income .....	151,375.57	147,419.56	3,956.01
Total Income .....	\$ 5,968,927.54	\$ 6,754,020.44	\$ *785,092.90
Rentals and Other Deductions from Income .....	389,914.98	317,654.50	72,260.48
Applicable to Interest.....	\$ 5,579,012.56	\$ 6,436,365.94	\$ *857,353.38
Fixed Interest Charges.....	3,430,088.49	3,358,211.04	71,877.45
Balance .....	\$ 2,148,924.07	\$ 3,078,154.90	\$ *929,230.83
Full Five Per Cent. Interest on Adjustment (Income) Bonds. 1,249,658.34		1,248,975.00	683.34
Surplus Income over Charges..	\$ 899,265.73	\$ 1,829,179.90	\$ *929,914.17
Surplus Income Rail Lines....	813,785.97	1,707,965.01	*894,179.04
Surplus Income Water Lines†.	85,479.76	121,214.89	*35,735.13

†Out of this year's surplus there was set aside \$40,000 and out of the 1911 surplus \$45,000 as a reserve fund for Betterments and Improvements. The Gross Revenue increased 5.03 per cent., Operating Expenses and Taxes increased 12.04 per cent., and Operating Income decreased 11.94 per cent.

The Operating Expenses of Rail Lines, exclusive of Taxes, were 71.02 per cent. of the Gross Revenue, as compared with 66.48 per cent. the previous year; and including Taxes 75.02 per cent. of Gross Revenue as compared with 70.23 per cent. for the preceding year.

\*Decrease.

## MILEAGE OPERATED.

The mileage of the Seaboard Air Line Railway and subsidiary lines in operation on June 30, 1911, was.....	3,046.18
Extensions, etc., constructed during the year.....	25.05
Less spur tracks taken up.....	1.11
Mileage in operation June 30, 1912.....	3,070.12

Made up as follows:

## MILEAGE OWNED.

Seaboard Air Line Railway and branches.....	3,004.53
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## LEASED LINES.

Meldrim, Ga., to Lyons, Ga.....	57.65
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## TRACKAGE.

Howells, Ga., to Atlanta, Ga.....	3.00
Hilton, N. C., to Navassa, N. C.....	2.40
In Birmingham, Ala., and vicinity.....	15.11
Near Mulberry, Fla.....	1.46
	79.62
	3,084.15

## DEDUCT.

Amelia Beach branch, leased to Street Railway Company at Fernandina, Fla.....	2.00
Gibson, N. C., branch, leased to the North & South Carolina Railway .....	10.13
Silver Springs, Fla., branch, leased to the Ocala Northern Railway .....	1.90
	14.03
Total mileage operated June 30, 1912.....	3,070.12
Sidings (including 19.15 miles on Leased Lines and Trackage)	777.12

## CAPITAL STOCK.

There has been no change in the capital stock of your Company during the year.

## FUNDED DEBT.

The additional \$4,000,000 of 4% Refunding Bonds sold in the previous fiscal year for later delivery as stated in the last annual report, were delivered during this fiscal year and the proceeds used to reimburse the Company for expenditures made to retire matured equipment trust obligations, and for additions, betterments and improvements to the property, and for the retirement of temporary obligations the proceeds of which had been similarly used.

The \$20,500 Adjustment Mortgage Bonds remaining unissued, were sold during the year and the proceeds used for the general corporate purposes of the Company.

There were redeemed and canceled during the year \$10,000 Florida Central and Peninsular Railroad Company Land Grant Extension 5% bonds.

## ACQUISITIONS.

Your Company has acquired during the year all the capital stock of:

Raleigh and Charleston Railroad Company, owning a line of road from Lumberton, N. C., to Marion, S. C., 43 miles, and, through stock ownership, an extension 12 miles in length known as the Marion & Southern Railroad, a total of 55 miles;  
Tampa Northern Railroad Company, owning a line of road from Tampa, Fla., to Brooksville, Fla., and branches, 58.25 miles, and important terminals at Tampa, Fla.

The properties of the Seaboard & Roanoke Railroad Company (81 miles)

and the Roanoke & Tar River Railroad Company (32 miles), the stocks of which were owned by the Seaboard Air Line Railway, were conveyed to your Company during the year and are therefore now directly owned. The mileage of these two roads has heretofore been included in that of your Company.

## GENERAL REMARKS.

During the year the gross revenue of the rail lines of your Company increased \$1,139,899.37. The freight train revenue per mile of road showed an increase of \$171.99, and the freight train revenue per train mile amounted to \$2.63 as compared with \$2.55 in the previous year. The passenger train revenue per mile of road showed an increase of \$115.82, and notwithstanding the large increase in passenger train mileage the passenger train earnings per train mile were slightly in excess of last year.

In addition to the more liberal expenditures for the maintenance of your property, the unfavorable weather conditions which existed during a considerable portion of the year, and which were almost unprecedented, contributed very largely to the increase in operating expenses. These were further added to by increased rates of wage schedules, increased cost of material and supplies, increased taxes, and the necessary compliance with the various laws in relation to equipment and service.

The road and equipment have been well maintained and, in view of the generally favorable business outlook, the officers of your Company feel that a considerable improvement in results during the next fiscal year may reasonably be expected.

Attention is called to the report of the Vice-President and General Manager and to the financial, operating and traffic statistical tables submitted by the Comptroller, appended hereto as a part of this report.

The accounts for the fiscal year were examined by Messrs. Haskins and Sells, Certified Public Accountants.

The Board records its appreciation of the loyal and efficient services rendered by the officers and employees of your Company during the year.

By order of the Board:

N. S. MELDRUM,  
President.

## SEABOARD AIR LINE RAILWAY.

OFFICE OF VICE-PRESIDENT AND GENERAL MANAGER.

PORTSMOUTH, Va., September 11, 1912.

Mr. N. S. MELDRUM, President,  
24 Broad Street, New York.

Dear Sir:—I submit below report covering the operation and physical condition of the rail lines of the Seaboard Air Line Railway for the fiscal year ended June 30, 1912.

Miles of road operated June 30, 1912.....3,070.12  
Average miles of road operated during the year.....3,058.63

## REVENUE.

Passenger .....	\$ 5,050,067.90
Freight .....	15,433,239.16
Mail .....	467,522.26
Express .....	819,290.62
Other transportation .....	335,538.02
Other than transportation.....	816,246.02

TOTAL REVENUE .....\$22,921,903.98

## EXPENSES.

Maintenance of Way and Structures.....	\$ 3,347,358.86
Maintenance of Equipment .....	3,212,277.60
Traffic Expenses .....	715,361.10
Transportation Expenses .....	8,333,357.51
General Expenses .....	671,731.74
Taxes .....	917,000.00

TOTAL EXPENSES AND TAXES.....\$17,197,086.81  
Net revenue from Operation.....5,724,817.17

The ratio of Operating Expenses and Taxes to Gross Revenue was 75.02%, against 70.23%, last year.

Average miles of road operated, shows an increase over previous year of 0.71 per cent.

Gross revenue shows an increase over last year of 5.23 per cent; Operating Expenses and Taxes show an increase of 12.41 per cent, and Net Revenue from Operation shows a decrease of 11.70 per cent.

The increase in Operating Expenses was due largely to increased charges to Maintenance on account of increased amount of work done over the previous year; to increased cost of materials and to increased wages paid to employees in the Roadway, Mechanical and Transportation departments. The Net Operating Revenue was further adversely affected by increase in Taxes and by changes in the character of freight traffic, the ton miles of which increased 9.04 per cent and yielded an increase of only 4.26 per cent in freight revenue.

## EQUIPMENT.

The equipment of the railway was maintained during the year at a cost of \$3,212,277.60.

Included in this cost is \$49,107.25 representing the value of equipment destroyed or retired from service, which was credited to the Cost of Equipment; \$321,356.91 for depreciation, which was credited to Reserve for Accrued Depreciation, and \$42,210.00 increase over previous year due to Federal Boiler Inspection Law.

The average cost of repairs per locomotive and per car owned, for the year, was as follows:

Locomotives .....	\$2,638.24
Passenger cars .....	812.92
Freight cars .....	63.63

Equipment undelivered on June 30, 1911, under Equipment Agreement, Series "M," viz.:

3 Postal Cars

were received during this fiscal year. The total liabilities under this agreement, to-wit: \$348,790, were paid during the year and the agreement was cancelled.

An Equipment Agreement, Series "N," was entered into on September 6th, 1911, for the purchase of:

- 10 Passenger Locomotives,
- 10 Freight Locomotives,
- 5 Switching Locomotives,
- 3 Postal Cars,
- 3 Passenger and Baggage Cars,
- 3 Express Cars,
- 1000 Ventilated Box Cars,
- 30 Caboose Cars,
- 200 Phosphate Cars,

for which \$275,650.20 was paid in cash and equipment trust obligations aggregating \$1,500,000 were issued, payable in twenty consecutive semi-annual installments of \$75,000 each, bearing interest at the rate of 4½% per annum. All of this equipment was received during the fiscal year.

There were built during the year at Portsmouth Shops, and put into service to replace Trust Equipment destroyed:

- 78 Flat Cars,
- 2 Steam Derrick Cars,
- 1 Steam Ditcher,

all of which have been received.

#### MAINTENANCE OF WAY AND STRUCTURES.

##### ROADWAY, TRACK AND STRUCTURES.

Roadway, track and structures of the railway have been maintained at a cost of \$3,347,358.86, which represents an expenditure per mile of road amounting to \$1,094.40.

#### SIDE TRACKS.

61.02 miles of new sidings and extensions of existing sidings were constructed, and there were deducted by removal and changes of old sidings 4.91 miles, making a net increase over previous year of 56.11 miles.

There were also constructed 1.44 miles of new sidings and extensions of existing sidings on leased lines, and 0.55 miles of old sidings removed, making a net increase over last year of 0.89 miles.

#### TIE RENEWALS.

The tie renewals were 1,445,787 cross ties and 890 sets of switch ties, and the cost, \$566,917.64, was charged to Operating Expenses.

#### NEW RAIL.

123.79 miles of new 75-pound and 85-pound steel rail were laid in the main line track, releasing therefrom 58, 60, 75, 80 and 85-pound worn rail, and there was charged net to Operating Expenses \$65,481.06 and to Capital Account \$111,643.36.

#### BALLAST.

256,071 cubic yards of gravel and slag ballast were put under main line track at a cost of \$169,865.69, of which \$160,514.55 was charged to Capital Account and \$9,351.14 to Operating Expenses.

#### TRESTLES FILLED.

10,435 lineal feet of wooden trestles were filled in, and of the total cost thereof, including culverts, \$62,211.36 was charged to Operating Expenses.

The filling of the Lincoln Street trestle at Columbia, S. C., reference to the progress of which was made in the last annual report, is included in the above-mentioned work.

TABLE No. 1.  
GENERAL BALANCE SHEET.  
JUNE 30, 1912.

ASSETS.		LIABILITIES.	
<b>PROPERTY INVESTMENT:</b>		<b>STOCK:</b>	
Road and Equipment:		Common Capital Stock.....	\$37,516,000.00
Road .....	\$137,602,275.70	Preferred Capital Stock.....	25,000,000.00
Equipment .....	\$18,479,018.51		
Equipment Series "I" and "K" (Per Contra).....	800,000.00	<b>TOTAL .....</b>	<b>\$62,516,000.00</b>
	\$19,279,018.51	<b>MORTGAGE, BONDED AND SECURED DEBT:</b>	
Less: Reserve for Accrued Depreciation .....	1,389,532.65	S. A. L. Railway First Mortgage Bonds .....	\$39,775,000.00
	17,889,485.86	Less: Pledged as Collateral. 27,000,000.00	
General Expenditures ...	28,876.66		12,775,000.00
	\$155,520,638.22	Mortgage Bonds, Proprietary Companies .....	\$39,665,000.00
Securities:		Less: Pledged as Collateral. 2,610,000.00	
Securities—Proprietary, Affiliated and Controlled Companies—Pledged:			37,055,000.00
Stocks .....	577,990.13	S. A. L. Railway Refunding Mortgage Bonds .....	\$24,445,000.00
Securities—Proprietary, Affiliated and Controlled Companies—Unpledged:		Less: Held in Treasury....	1,445,000.00
Stocks .....	401,678.33		23,000,000.00
Bonds .....	203,000.00	S. A. L. Railway Adjustment Mortgage Bonds .....	25,000,000.00
	1,182,668.46		97,830,000.00
Other Investments:		Equipment Trust Obligations 4,680,000.00	
Leased Rail and Material.....	398,647.51	Equipment Trust Certificates Series "I" and "K" (Per Contra) .....	800,000.00
Securities—Pledged .....	1,082,009.85		5,480,000.00
Securities—Unpledged .....	335,927.25	<b>TOTAL .....</b>	<b>\$103,310,000.00</b>
	1,816,584.61	<b>WORKING LIABILITIES:</b>	
Common Capital Stock in Treasury.....	496,600.00	Traffic and Car Service Balances due other Companies .....	\$357,688.14
Preferred Capital Stock in Treasury.....	1,105,900.00	Audited Vouchers Unpaid.....	756,531.00
	1,602,500.00	Wages Unpaid .....	760,233.40
<b>TOTAL .....</b>	<b>\$160,122,391.29</b>	Claim Authorities .....	41,292.17
<b>WORKING ASSETS:</b>		Agents' Traffic Drafts.....	106,557.27
Cash with Treasurer and Cashier .....	\$521,085.65	Miscellaneous Accounts Payable.....	74,404.02
Cash in Transit.....	387,295.99	Matured Interest Funded Debt.....	710,222.50
Cash with Fiscal Agencies....	784,514.35	Matured Interest Equipment Trust Obligations .....	10,291.25
	\$1,692,895.99	Matured Bonded Debt.....	64,000.00
Loans and Bills Receivable.....	59,516.12	Other Working Liabilities.....	64,230.49
Traffic and Car Service Balances due from other Companies .....	224,228.69	<b>TOTAL .....</b>	<b>\$2,945,450.24</b>
Net Balances due from Agents and Conductors .....	332,766.93	<b>ACCRUED LIABILITIES NOT DUE:</b>	
Due from United States Government....	55,683.40	Accrued Interest Funded Debt.....	\$475,079.17
Miscellaneous Accounts Receivable.....	383,615.53	Accrued Interest Equipment Trust Obligations .....	44,973.95
Claims Receivable .....	37,267.50	Accrued Interest Adjustment Mortgage Bonds .....	833,333.34
Material and Supplies.....	1,367,539.62	Accrued Taxes .....	353,635.48
Other Working Assets.....	169,972.96	Other Accrued Accounts.....	11,015.08
	\$4,323,486.74	<b>TOTAL .....</b>	<b>\$1,718,037.02</b>
<b>TOTAL .....</b>	<b>\$4,323,486.74</b>	<b>DEFERRED CREDIT ITEMS:</b>	
<b>DEFERRED DEBIT ITEMS:</b>		Operating Reserves .....	\$248,168.08
Advances to Proprietary, Affiliated and Controlled Companies .....	\$232,716.89	Other Reserves .....	61,582.32
Working and Other Advances.....	178,247.35	Interchangeable Mileage Tickets.....	144,451.48
Insurance paid in Advance.....	80,583.28	Reserve for Outstanding Stock of Proprietary Companies .....	31,426.41
Unextinguished Discount on Securities...	10,587,737.24	Other Deferred Credit Items.....	32,632.85
Special Deposits .....	21,022.73	<b>TOTAL .....</b>	<b>\$518,261.14</b>
Cash in Redemption Funds.....	5,812.10	<b>PROFIT AND LOSS:</b>	
Claims in Suspense.....	326,406.04	Surplus .....	\$4,949,039.43
Other Deferred Debit Items.....	78,384.17	<b>TOTAL .....</b>	<b>\$175,956,787.83</b>
<b>TOTAL .....</b>	<b>\$11,510,909.80</b>	<b>BONDS.</b>	
<b>TOTAL .....</b>	<b>\$175,956,787.83</b>	Richmond-Washington Co. Collateral Trust Mortgage (Seaboard proportion 1-6) .....	9,500,000.00
<b>This Company is liable as a guarantor of the:</b>		Macon, Dublin & Savannah Railroad First Mortgage.....	1,390,000.00
Jacksonville Terminal Company First Mortgage (Seaboard proportion 1-3) .....	\$500,000.00	Savannah & Statesboro Railroad First Mortgage.....	185,000.00
Birmingham Terminal Company First Mortgage (Seaboard proportion 1-6) .....	1,940,000.00	Raleigh & Charleston Railroad Prior Lien Mortgage.....	350,000.00
Wilmington Railway Bridge Co. (Seaboard proportion 1-2) ..	217,000.00	Raleigh & Charleston Railroad Consolidated Mortgage.....	200,000.00
		Tampa Northern Railroad Notes.....	200,000.00



## TRESTLES REBUILT AND BALLAST DECKED.

There were built during the year with creosoted timber 5,555 lineal feet of trestles, which have been ballast decked at a cost of \$58,125.23, which was charged to Operating Expenses.

## TRESTLES STRENGTHENED.

Additional stringers were put in 178 trestles during the year to strengthen same to carry the heavier power and traffic.

## BRIDGES.

Work has been done on forty-four bridges, replacing with steel or strengthening them for heavy traffic. Of this number, twenty-five have been completed, and the remaining nineteen will be finished by June 30th, 1913.

Seven of the above bridges were authorized during this year and five of the seven have been completed.

Of the bridges completed the principal ones are:

	Steel
Taylor's Creek bridge, near Skelton, Va.....	271 feet.
Great Creek bridge, near Cochran, Va.....	411 "
Lincoln Street extension, Columbia, S. C., total length including fill, 2,462 feet.....	350 "
Savannah River draw-bridge and fixed spans, near Clio, Ga.....	500 "
Six Mile Creek bridge, near Ybor City, Fla.....	102 "
Manatee River draw-bridge, Manatee, Fla.....	145 "
Lee Street, Americus, Ga., overpass, reinforced concrete bridge..	44 "
Pee Dee River bridge, near Pee Dee, N. C., total length entire crossing 1,673 feet.....	1,099 "
Long Creek bridge, near Mt. Holly, N. C.....	300 "
Indian Creek bridge, near Crouses, N. C.....	216 "
Cox Creek bridge, near Pride, S. C.....	94 "
Little River bridge, near Watts, S. C.....	103 "
Fork Creek bridge, near Berkeley, Ga.....	103 "
Yellow River bridge, near Gloster, Ga.....	103 "
Sweet Water Creek bridge, near McFauls, Ga.....	103 "
Peachtree Creek bridge No. 1, near Belt Junction, Ga.....	103 "

The total expenditures for bridge renewals during the year were \$374,440.30, of which \$243,513.99 was charged to Capital Account and \$130,926.31 to Operating Expenses.

## RAIL IN MAIN LINE TRACK.

Of the total operated main line mileage of the system, 3,069.89 miles are laid with steel rails and 0.23 miles with iron rails.

The steel rail is made up as follows:

Miles.	Weight.
76.89.....	.85 lb. rail.
117.17.....	.80 "
1,242.09.....	.75 "
167.29.....	.70 "
227.66.....	.68 "
18.87.....	.65 "
60.48.....	.63.5 "
20.86.....	.60.5 "
576.26.....	.60 "
35.41.....	.60 " (resawed)
243.72.....	.58 "
283.19.....	.56 " and lighter.

The above does not include 2.00 miles of Amelia Beach Branch, leased to Street Railway at Fernandina, Fla.; 10.13 miles of Gibson Branch, leased to North & South Carolina Railway; or 1.90 miles of Silver Springs Branch, leased to Ocala Northern Railway.

## NEW EXTENSIONS.

Extensions to the Company's line in Florida during the year were made as follows:

The extension from Fruitville to Venice mentioned in last year's report was completed.....	16.53 miles
The extension of the Dunnellon line to Inverness (with a spur to Holder Mine).....	8.52 "
In addition to the above-named extensions, spurs have been built which are not included as main line mileage, as follows:	
Spur from Dunnellon line to Camp Phosphate Company's Barr mine.....	2.14 "
Spur from old P. C. A. & G. line, near Alafia, to State Phosphate Company's mine.....	1.30 "
Construction work has also begun and is proceeding on the extension from Mulberry to Bartow (with the branch line to the Royster mine) of approximately.....	12 "

## GENERAL REMARKS.

The additional terminal facilities at Raleigh, Wilmington and Savannah, referred to in last annual report, were completed and work on additional terminal improvements is now in progress at Wilmington, Savannah and Jacksonville.

A considerable amount of dredging has been done at Savannah, Jacksonville and Tampa during the year to maintain proper depths of water.

The union passenger stations mentioned in report of last year at Weldon, N. C., and Tampa, Fla., were completed. Union passenger stations have been provided at Ocilla, Ga., and Bostic, N. C., and the Union Station at Vidalia, Ga., is in the course of construction.

Modern Passenger Stations have been built at Athens, Ga., Abbeville, S. C., Leesburg, Fla., and Richland, Ga., during the year.

At Savannah, Ga., a new reinforced concrete roundhouse and modern steel and concrete machine and erecting shops and power house have been built to replace the wooden shop buildings which were destroyed by fire.

At Portsmouth, Va., a corrugated iron building for the storage of records has been constructed.

At Savannah, Ga., 6,700 square yards of brick cotton platform have been laid at a cost of \$4,355.00 which was charged to Operating Expenses, to replace worn-out wooden platform.

Extensions have been made to the yards at Wilmington, N. C., Savannah, Ga., and Jacksonville, Fla., and new yards and mechanical facilities are in progress of construction at Norlina, N. C., and Cayce, S. C.

Ten old twenty-thousand gallon water stations have been replaced with modern fifty-thousand gallon tanks and suitable pumping facilities have been provided.

The floor of the Jacksonville, Fla., forwarding warehouse has been filled in with earth, and instead of relaying the floor with timber, creosoted blocks have been used.

The docks at Fernandina have been rebuilt with creosoted piles and timber, and the Maxwell lumber dock at Jacksonville, Fla., is being rebuilt and filled in with earth to replace decayed wooden platform.

Mechanical coal hoists have been provided at Wilmington, N. C., and Plant City, Fla., and the coal wharf at Whitmire, S. C., has been rebuilt.

Nine sets of track scales have been rebuilt with concrete foundations and steel I-beams, replacing wood.

Considerable improvement has been made to station buildings by renewing floors with both timber and concrete, extending and renewing platforms and replacing decayed wooden roofs with metal shingles.

192 industrial sidings and extensions to industrial sidings already existing have been constructed or are in process of construction.

69 depots and freight stations have been constructed or substantially added to during the year.

70 passing tracks have been constructed or extended, or are in process of construction.

The telephone line for dispatching trains, referred to in last year's report, has been completed, and this, with lines already in use, makes approximately 1,089 miles of line in service on the system.

Respectfully submitted,

C. H. HIX,  
Vice-President and General Manager.

TABLE No. 2.  
INCOME ACCOUNT.  
YEAR ENDED JUNE 30, 1912.

	1912.	1911.	INCREASE OR DECREASE.
Gross Revenue .....	\$22,921,903.98	\$21,782,004.61	\$1,139,899.37
Operating Expenses .....	16,280,086.81	14,480,567.47	1,799,519.34
Net Operating Revenue.....	\$6,641,817.17	\$7,301,437.14	—\$659,619.97
Income from Rentals.....	98,894.42	94,928.20	3,966.22
Income from Other Sources.....	51,646.67	51,025.13	621.54
TOTAL INCOME .....	\$6,792,358.26	\$7,447,390.47	—\$655,032.21
Interest Funded Debt.....	\$3,146,904.44	\$3,059,101.69	\$87,802.75
Interest Adjustment Mortgage Bonds .....	1,249,658.34	1,248,975.00	683.34
Interest Equipment Trust Obligations .....	288,986.77	286,799.80	2,186.97
Other Interest .....	Credit 8,000.65	12,309.55	—20,310.20
Taxes .....	917,000.00	818,000.00	99,000.00
Rents for Lease of Road.....	51,000.00	51,000.00	.....
Rents for other property.....	109,239.05	109,115.92	123.13
Hire of Equipment.....	201,098.32	143,873.71	57,224.61
Outside Operations .....	22,686.02	10,249.79	12,436.23
TOTAL DEDUCTIONS .....	\$5,978,572.29	\$5,739,425.46	\$239,146.83
NET INCOME FOR YEAR....	\$813,785.97	\$1,707,965.01	—\$894,179.04
Deduct proportion of annual allotment of discount on Bonds..	248,192.88	178,637.38	69,555.50
SURPLUS, carried to credit of Profit and Loss.....	\$565,593.09	\$1,529,327.63	—\$963,734.54
— Decrease.			

TABLE NO. 3.  
PROFIT AND LOSS.  
YEAR ENDED JUNE 30, 1912.

By Balance June 30, 1911.....	\$4,112,333.38
By Income for Year.....	565,593.09
By Delayed Income Credits.....	255,832.57
By Unclaimed Wages written off.....	17,654.39
By Miscellaneous Credits .....	187.00
To Miscellaneous Debits .....	\$2,561.00
To Balance as per Balance Sheet.....	4,949,039.43
	\$4,951,600.43
	\$4,951,600.43

TABLE NO. 9.  
EXPENDITURES FOR IMPROVEMENTS, BETTERMENTS AND EXTENSIONS, CHARGED TO CAPITAL ACCOUNT.  
YEAR ENDED JUNE 30, 1912.

CONSTRUCTION:	
Engineering .....	\$25,502.58
Right of Way and Station Grounds.....	31,571.82
Real Estate .....	Cr. 11,653.67
Grading .....	173,925.14
Tunnels .....	24,399.50
Bridges, Trestles and Culverts.....	274,122.64
Ties .....	72,877.65
Rails .....	323,113.43
Frogs and Switches.....	27,716.15
Track Fastenings and Other Material.....	59,787.09
Ballast .....	80,219.67
Track Laying and Surfacing.....	172,973.58
Roadway Tools .....	Cr. 35.85
Fencing Right of Way.....	7,122.88
Crossings and Signs.....	15,370.36
Interlocking and Other Signal Apparatus.....	4,015.37
Telegraph and Telephone Lines.....	10,181.43
Station Buildings and Fixtures.....	148,842.00
Shops, Enginehouses and Turntables.....	37,202.54
Shop Machinery and Tools.....	20,098.93
Water Stations .....	16,273.32
Fuel Stations .....	6,737.28
Storage Warehouses .....	159,912.33
Dock and Wharf Property.....	174,503.88
Miscellaneous Structures .....	35,074.62
Rent of Equipment .....	2,155.00
Cost of Road Purchased.....	39,914.34
TOTAL CONSTRUCTION .....	\$1,931,924.01
EQUIPMENT:	
Steam Locomotives .....	\$461,400.70
Passenger Train Cars.....	112,120.21
Freight Train Cars.....	1,113,409.82
Work Equipment .....	73,123.26
TOTAL EQUIPMENT.....	\$1,760,053.99
GRAND TOTAL.....	\$3,691,978.00
SUMMARY OF EXPENDITURES:	
Additions and Betterments on Existing Mileage.....	\$1,666,193.69
Equipment Acquired .....	1,760,053.99
Expenditures for Extensions.....	265,730.32
TOTAL AS ABOVE.....	\$3,691,978.00

TABLE No. 10.  
TRAFFIC STATISTICS.  
YEAR ENDED JUNE 30, 1912.

	1912.	1911.	INCREASE OR DECREASE.
Average miles operated.....	3,058.63	3,037.04	21.59
<b>PASSENGER TRAFFIC.</b>			
Number of Passengers carried.....	4,870,104	4,573,532	296,572
Number of Passengers carried one mile.....	231,202,542	221,058,350	10,144,192
Number of Passengers carried one mile per mile of road.....	75,590	72,787	2,803
Average distance carried each Passenger.....	47.47	48.33	— .86
Total Revenue from Passengers.....	\$5,050,067.90	\$4,735,503.65	\$314,564.25
Average Amount received from each Passenger.....	\$1.03.695	\$1.03.542	\$ .00.153
Average receipt per Passenger per mile.....	\$ .02.184	\$ .02.142	\$ .00.042
Total Passenger Train Revenue.....	\$6,440,499.17	\$6,043,294.14	\$397,205.03
Passenger Train Revenue per mile of road.....	\$2,105.68	\$1,989.86	\$115.82
Passenger Train Revenue per train mile.....	\$1.18.146	\$1.17.560	\$ .00.586
Average number of Passengers per train mile.....	42.41	43.00	— .59
Average number of Passengers per car mile.....	7.88	7.95	— .07
<b>FREIGHT TRAFFIC.</b>			
<b>REVENUE FREIGHT.</b>			
Number of tons carried.....	9,406,877	8,982,191	424,686
Number of tons carried one mile.....	1,390,977,614	1,275,651,651	115,325,963
Number of tons carried one mile per mile of road.....	454,771	420,031	34,740
Average distance hauled each ton.....	147.87	142.02	5.85
Total Freight Train Revenue.....	\$15,433,239.16	\$14,801,968.65	\$631,270.51
Average amount received from each ton.....	\$1.64.063	\$1.64.792	— \$ .00.729
Average receipt per ton per mile.....	\$ .01.110	\$ .01.160	— \$ .00.050
Freight Train Revenue per mile of road.....	\$5,045.80	\$4,873.81	\$171.99
Freight Train Revenue per train mile.....	\$2.63.200	\$2.54.880	\$ .08.320
Average number of tons per train mile.....	237.22	219.84	17.38
Average number of tons per loaded car mile.....	14.87	14.14	.73
<b>ALL FREIGHT</b>			
<b>(Including Company's Material, hauled free).</b>			
Number of tons carried.....	10,897,475	10,914,967	—17,492
Number of tons carried one mile.....	1,575,592,671	1,463,211,329	112,381,342
Average number of tons per train mile.....	267.98	251.16	16.82
Average number of tons per loaded car mile.....	16.84	16.21	.63
<b>REVENUE AND OPERATING EXPENSES.</b>			
Passenger and Freight Train Revenue.....	\$21,873,738.33	\$20,845,262.79	\$1,028,475.54
Passenger and Freight Train Revenue per mile of road.....	\$7,151.48	\$6,863.67	\$287.81
Gross Revenue.....	\$22,921,903.98	\$21,782,004.61	\$1,139,899.37
Gross Revenue per mile of road.....	\$7,494.17	\$7,172.12	\$322.05
Gross Revenue per train mile.....	\$2.02.274	\$1.98.958	\$ .03.316
Operating Expenses.....	\$16,280,086.81	\$14,480,567.47	\$1,799,519.34
Operating Expenses per mile of road.....	\$5,322.67	\$4,767.99	\$554.68
Operating Expenses per train mile.....	\$1.43.663	\$1.32.266	\$ .11.397
Net Operating Revenue.....	\$6,641,817.17	\$7,301,437.14	— \$659,619.97
Net Operating Revenue per mile of road.....	\$2,171.50	\$2,404.13	— \$232.63
Net Operating Revenue per train mile.....	\$58.611	\$66.692	— \$8.081